

# References

- [1] Samiksha Shrivastava, Sampa Saha, Awaneesh Singh, et al. Dissipative particle dynamics simulation study on atp-brush modification of variably shaped surfaces and biopolymer adsorption. *Physical Chemistry Chemical Physics*, 24(30):17986–18003, 2022.
- [2] Shrivastava Samiksha, Upadhyay Ashank, Pradhan Subhashree Subhasmita, Saha Sampa, and Singh Awaneesh. Evolution kinetics of stabilizing pickering emulsion by brush-modified janus particles: Dpd simulation and experimental insights. *Langmuir*, 2024.
- [3] Subhashree Pradhan, Ashank Upadhyay, Samiksha Shrivastava, Awaneesh Singh, and Sampa Saha. Architectural influence of polymer brush-modified tri-compartmental anisotropic particles in stabilizing pickering emulsion. *ACS Applied Polymer Materials*, 2024.
- [4] Samiksha Shrivastava and Awaneesh Singh. Phase separation kinetics of binary mixture in the influence of bond disorder: sensitivity to quench temperature. *Phase Transitions*, 96(5):311–327, 2023.
- [5] Paul M Chaikin, Tom C Lubensky, and Thomas A Witten. *Principles of condensed matter physics*, volume 10. Cambridge university press Cambridge, 1995.
- [6] Richard AL Jones. *Soft condensed matter*, volume 6. Oxford University Press, 2002.
- [7] Subhashree Subhasmita Pradhan and Sampa Saha. Advances in design and applications of polymer brush modified anisotropic particles. *Advances in Colloid and Interface Science*, 300:102580, 2022.
- [8] K Binder and P Fratzl. *Spinodal decomposition in materials science and technology*, 2013.
- [9] Alan J Bray. Theory of phase-ordering kinetics. *Advances in Physics*, 43(3):357–459, 1994.
- [10] Sanjay Puri. Kinetics of phase transitions. In *Kinetics of phase transitions*, pages 13–74. CRC press, 2009.
- [11] JD Gunton, M San Miguel, and Paramdeep S Sahni. *Phase transitions and critical phenomena*, 1983.
- [12] Akira Onuki. *Phase transition dynamics*. Cambridge University Press, 2002.
- [13] Pierre C Hohenberg and Bertrand I Halperin. Theory of dynamic critical phenomena. *Reviews of Modern Physics*, 49(3):435, 1977.
- [14] John W Cahn and John E Hilliard. Free energy of a nonuniform system. i. interfacial free energy. *The Journal of chemical physics*, 28(2):258–267, 1958.
- [15] David Landau and Kurt Binder. *A guide to Monte Carlo simulations in statistical physics*. Cambridge university press, 2021.
- [16] Sanjay Puri. Kinetics of phase transitions. *Phase Transitions*, 77(5-7):407–431, 2004.
- [17] Michael Rubinstein and Ralph H Colby. *Polymer physics*. Oxford university press, 2003.
- [18] Hazime Mori and Kyozi Kawasaki. Theory of dynamical behaviors of ferromagnetic spins. *Progress of Theoretical Physics*, 27(3):529–570, 1962.

- [19] Mark F Gyure, Stephen T Harrington, Richard Strilka, and H Eugene Stanley. Scaling in late stage spinodal decomposition with quenched disorder. *Physical Review E*, 52(5):4632, 1995.
- [20] Wujie Wang and Rafael Gómez-Bombarelli. Coarse-graining auto-encoders for molecular dynamics. *npj Computational Materials*, 5(1):125, 2019.
- [21] Stephen L Mayo, Barry D Olafson, and William A Goddard. Dreiding: a generic force field for molecular simulations. *Journal of Physical chemistry*, 94(26):8897–8909, 1990.
- [22] Robert D Groot and Patrick B Warren. Dissipative particle dynamics: Bridging the gap between atomistic and mesoscopic simulation. *J. Chem. Phys.*, 107(11):4423–4435, 1997.
- [23] Pep Espanol and Patrick Warren. Statistical mechanics of dissipative particle dynamics. *EPL*, 30(4):191, 1995.
- [24] Berni J Alder and Thomas Everett Wainwright. Studies in molecular dynamics. i. general method. *The Journal of Chemical Physics*, 31(2):459–466, 1959.
- [25] Shiyi Chen and Gary D Doolen. Lattice boltzmann method for fluid flows. *Annual review of fluid mechanics*, 30(1):329–364, 1998.
- [26] Donald L Ermak and J Andrew McCammon. Brownian dynamics with hydrodynamic interactions. *The Journal of chemical physics*, 69(4):1352–1360, 1978.
- [27] PJ Hoogerbrugge and JMVA Koelman. Simulating microscopic hydrodynamic phenomena with dissipative particle dynamics. *Europhysics letters*, 19(3):155, 1992.
- [28] Pep Espanol and Patrick B Warren. Perspective: Dissipative particle dynamics. *J. Chem Phys.*, 146(15):150901, 2017.
- [29] Ashish Kumar Singh, Avinash Chauhan, Sanjay Puri, and Awaneesh Singh. Photo-induced bond breaking during phase separation kinetics of block copolymer melts: a dissipative particle dynamics study. *Soft Matter*, 17(7):1802–1813, 2021.
- [30] Xijun Fan, Nhan Phan-Thien, Shuo Chen, Xuhong Wu, and Teng Yong Ng. Simulating flow of dna suspension using dissipative particle dynamics. *Physics of Fluids*, 18(6), 2006.
- [31] F Ferrini, D Ercolani, B De Cindio, L Nicodemo, L Nicolais, and S Ranaudo. Shear viscosity of settling suspensions. *Rheologica Acta*, 18:289–296, 1979.
- [32] Vasileios Symeonidis, George Em Karniadakis, and Bruce Caswell. Schmidt number effects in dissipative particle dynamics simulation of polymers. *The Journal of chemical physics*, 125(18), 2006.
- [33] Steve Plimpton. Fast parallel algorithms for short-range molecular dynamics. *Journal of computational physics*, 117(1):1–19, 1995.
- [34] Xin Yong, Olga Kuksenok, and Anna C Balazs. Modeling free radical polymerization using dissipative particle dynamics. *Polymer*, 72:217–225, 2015.
- [35] Xin Yong, Olga Kuksenok, Krzysztof Matyjaszewski, and Anna C Balazs. Harnessing interfacially-active nanorods to regenerate severed polymer gels. *Nano letters*, 13(12):6269–6274, 2013.
- [36] Awaneesh Singh, Olga Kuksenok, Jeremiah A Johnson, and Anna C Balazs. Photo-regeneration of severed gel with iniferter-mediated photo-growth. *Soft Matter*, 13(10):1978–1987, 2017.
- [37] Awaneesh Singh, Olga Kuksenok, Jeremiah A Johnson, and Anna C Balazs. Tailoring the structure of polymer networks with iniferter-mediated photo-growth. *Polymer Chemistry*, 7(17):2955–2964, 2016.

- [38] Mao Chen, Yuwei Gu, Awaneesh Singh, Mingjiang Zhong, Alex M Jordan, Santidan Biswas, LaShanda TJ Korley, Anna C Balazs, and Jeremiah A Johnson. Living additive manufacturing: transformation of parent gels into diversely functionalized daughter gels made possible by visible light photoredox catalysis. *ACS central science*, 3(2):124–134, 2017.
- [39] Shensheng Chen and Xin Yong. Janus nanoparticles enable entropy-driven mixing of bicomponent hydrogels. *Langmuir*, 35(46):14840–14848, 2019.
- [40] Ifra, Awaneesh Singh, and Sampa Saha. High adsorption of  $\alpha$ -glucosidase on polymer brush-modified anisotropic particles acquired by electrospraying—a combined experimental and simulation study. *ACS Applied Bio Materials*, 4(10):7431–7444, 2021.
- [41] Dorothy Gogoi, Avinash Chauhan, Sanjay Puri, and Awaneesh Singh. Segregation of fluids with polymer additives at domain interfaces: a dissipative particle dynamics study. *Soft Matter*, 19(34):6433–6445, 2023.
- [42] Manfred Schmidt and Walther Burchard. Translational diffusion and hydrodynamic radius of unperturbed flexible chains. *Macromolecules*, 14(1):210–211, 1981.
- [43] Christoph Junghans, Matej Praprotnik, and Kurt Kremer. Transport properties controlled by a thermostat: An extended dissipative particle dynamics thermostat. *Soft Matter*, 4(1):156–161, 2008.
- [44] Babak Nikoobakht and Mostafa A El-Sayed. Preparation and growth mechanism of gold nanorods (nrs) using seed-mediated growth method. *Chemistry of materials*, 15(10):1957–1962, 2003.
- [45] Hsiao-Ping Hsu and Kurt Kremer. Static and dynamic properties of large polymer melts in equilibrium. *The Journal of Chemical Physics*, 144(15), 2016.
- [46] Petri Nikunen, Ilpo Vattulainen, and Mikko Karttunen. Reptational dynamics in dissipative particle dynamics simulations of polymer melts. *Physical Review E—Statistical, Nonlinear, and Soft Matter Physics*, 75(3):036713, 2007.
- [47] Argyrios Karatrantos, Nigel Clarke, Russell J Composto, and Karen I Winey. Topological entanglement length in polymer melts and nanocomposites by a dpd polymer model. *Soft Matter*, 9(14):3877–3884, 2013.
- [48] Ya Liu, Olga Kuksenok, Ximin He, Michael Aizenberg, Joanna Aizenberg, and Anna C Balazs. Harnessing cooperative interactions between thermoresponsive aptamers and gels to trap and release nanoparticles. *ACS Applied Materials & Interfaces*, 8(44):30475–30483, 2016.
- [49] Krzysztof Matyjaszewski and James Spanswick. Controlled/living radical polymerization. In *Handbook of Polymer Synthesis*, pages 907–954. CRC Press, 2004.
- [50] Jin-Shan Wang and Krzysztof Matyjaszewski. Controlled/" living" radical polymerization. atom transfer radical polymerization in the presence of transition-metal complexes. *Journal of the American Chemical Society*, 117(20):5614–5615, 1995.
- [51] Krzysztof Matyjaszewski and Jianhui Xia. Atom transfer radical polymerization. *Chemical reviews*, 101(9):2921–2990, 2001.
- [52] Krzysztof Matyjaszewski. Fundamentals of controlled/living radical polymerization. *Encyclopedia of Radicals in Chemistry, Biology and Materials*, 2012.
- [53] Khubab Shaker and Asif Hafeez. Introduction to “advanced functional polymers: Synthesis to applications”. In *Advanced Functional Polymers: Synthesis to Applications*, pages 1–2. Springer, 2023.
- [54] O Vogl. Functional polymers. *Die Makromolekulare Chemie: Macromolecular Chemistry and Physics*, 7(S19841):1–15, 1984.
- [55] Monzur Ali and Steve Brocchini. Synthetic approaches to uniform polymers. *Advanced Drug Delivery Reviews*, 58(15):1671–1687, 2006.

- [56] Kaojin Wang, Kamran Amin, Zesheng An, Zhengxu Cai, Hong Chen, Hongzheng Chen, Yuping Dong, Xiao Feng, Weiqiang Fu, Jiabao Gu, et al. Advanced functional polymer materials. *Materials Chemistry Frontiers*, 4(7):1803–1915, 2020.
- [57] Muhammad Arshad, Muhammad Zubair, Saadman S Rahman, and Aman Ullah. Polymers for advanced applications. In *Polymer Science and Nanotechnology*, pages 325–340. Elsevier, 2020.
- [58] Moustafa M Zagho, Essraa A Hussein, and Ahmed A Elzatahry. Recent overviews in functional polymer composites for biomedical applications. *Polymers*, 10(7):739, 2018.
- [59] Michal Dziadek, Ewa Stodolak-Zych, and Katarzyna Cholewa-Kowalska. Biodegradable ceramic-polymer composites for biomedical applications: A review. *Materials Science and Engineering: C*, 71:1175–1191, 2017.
- [60] Fengwei Xie. Sustainable polymer composites: functionality and applications. *Functional Composite Materials*, 2(1):15, 2021.
- [61] Krzysztof Matyjaszewski, Thomas P Davis, et al. *Handbook of radical polymerization*, volume 922. Wiley Online Library, 2002.
- [62] Masami Kamigaito, Tsuyoshi Ando, and Mitsuo Sawamoto. Metal-catalyzed living radical polymerization. *Chemical Reviews*, 101(12):3689–3746, 2001.
- [63] Roshan TA Mayadunne, Ezio Rizzardo, John Chiefari, Yen Kwong Chong, Graeme Moad, and San H Thang. Living radical polymerization with reversible addition- fragmentation chain transfer (raft polymerization) using dithiocarbamates as chain transfer agents. *Macromolecules*, 32(21):6977–6980, 1999.
- [64] Wade A Braunecker and Krzysztof Matyjaszewski. Controlled/living radical polymerization: Features, developments, and perspectives. *Progress in polymer science*, 32(1):93–146, 2007.
- [65] Nicolay V Tsarevsky and Krzysztof Matyjaszewski. “green” atom transfer radical polymerization: from process design to preparation of well-defined environmentally friendly polymeric materials. *Chemical reviews*, 107(6):2270–2299, 2007.
- [66] Mitsuru Kato, Masami Kamigaito, Mitsuo Sawamoto, and Toshinobu Higashimura. Polymerization of methyl methacrylate with the carbon tetrachloride/dichlorotris-(triphenylphosphine) ruthenium (ii)/methyl aluminum bis (2, 6-di-tert-butylphenoxide) initiating system: possibility of living radical polymerization. *Macromolecules*, 28(5):1721–1723, 1995.
- [67] Craig J Hawker, Anton W Bosman, and Eva Harth. New polymer synthesis by nitroxide mediated living radical polymerizations. *Chemical reviews*, 101(12):3661–3688, 2001.
- [68] Jan Genzer. In silico polymerization: Computer simulation of controlled radical polymerization in bulk and on flat surfaces. *Macromolecules*, 39(20):7157–7169, 2006.
- [69] Haifeng Gao, Ke Min, and Krzysztof Matyjaszewski. Gelation in atp using structurally different branching reagents: Comparison of inimer, divinyl and trivinyl cross-linkers. *Macromolecules*, 42(21):8039–8043, 2009.
- [70] Reinier LC Akkermans, So/ren Toxvaerd, and Willem J Briels. Molecular dynamics of polymer growth. *The Journal of chemical physics*, 109(7):2929–2940, 1998.
- [71] Santidan Biswas, Awaneesh Singh, Antoine Beziau, Tomasz Kowalewski, Krzysztof Matyjaszewski, and Anna C Balazs. Modeling the formation of layered, amphiphilic gels. *Polymer*, 111:214–221, 2017.
- [72] Antoine Beziau, Awaneesh Singh, Rafael NL de Menezes, Hangjun Ding, Antonina Simakova, Olga Kuksenok, Anna C Balazs, Tomasz Kowalewski, and Krzysztof Matyjaszewski. Miktoarm star copolymers as interfacial connectors for stackable amphiphilic gels. *Polymer*, 101:406–414, 2016.

- [73] Ifra Mirza and Sampa Saha. Biocompatible anisotropic polymeric particles: synthesis, characterization, and biomedical applications. *ACS Applied Bio Materials*, 3(12):8241–8270, 2020.
- [74] Aiswarya Thattaru Thodikayil, Shivangi Sharma, and Sampa Saha. Engineering carbohydrate-based particles for biomedical applications: strategies to construct and modify. *ACS Applied Bio Materials*, 4(4):2907–2940, 2021.
- [75] Michele Fromel, Mingxiao Li, and Christian W Pester. Surface engineering with polymer brush photolithography. *Macromolecular rapid communications*, 41(18):2000177, 2020.
- [76] Genkuo Nie, Guozhu Li, Li Wang, and Xiangwen Zhang. Nanocomposites of polymer brush and inorganic nanoparticles: preparation, characterization and application. *Polymer Chemistry*, 7(4):753–769, 2016.
- [77] Markus Müllner. Molecular polymer brushes in nanomedicine. *Macromolecular Chemistry and Physics*, 217(20):2209–2222, 2016.
- [78] Amir Beheshti, Yun Huang, Idriss Blakey, and Jason R Stokes. Macroscale superlubricity induced by film-forming polymer brush-grafted colloidal additives. *Journal of Colloid and Interface Science*, 634:703–714, 2023.
- [79] Ary R. Murad, Ahmed Iraqi, Shujahadeen B Aziz, Sozan N. Abdullah, and Mohamad A Brza. Conducting polymers for optoelectronic devices and organic solar cells: A review. *Polymers*, 12(11):2627, 2020.
- [80] Ian A VonWald, Mark M Moog, Travis W LaJoie, Joshua D Yablonski, Dean M DeLongchamp, Jason Locklin, Frank Tsui, and Wei You. Morphology, structure, and enhanced intramolecular conduction in ultralong conjugated polymer brushes. *The Journal of Physical Chemistry C*, 122(14):7586–7596, 2018.
- [81] Binta Zhao, Xi Lu, Qian Wang, Jingfa Yang, Jiang Zhao, and Henghui Zhou. Enhancing the ionic conductivity in a composite polymer electrolyte with ceramic nanoparticles anchored to charged polymer brushes. *Chinese Chemical Letters*, 31(3):831–835, 2020.
- [82] Qian Zhang, Yin Liao, Lipeng He, and Weifeng Bu. Spherical polymer brushes in solvents of variable quality: an experimental insight by tem imaging. *Langmuir*, 29(13):4181–4186, 2013.
- [83] Shuguang Wang, Zhongwu Wang, Jie Li, Liqiang Li, and Wenping Hu. Surface-grafting polymers: from chemistry to organic electronics. *Materials Chemistry Frontiers*, 4(3):692–714, 2020.
- [84] Zachariah A Page, Benjaporn Narupai, Christian W Pester, Raghida Bou Zerdan, Anatoliy Sokolov, David S Laitar, Sukrit Mukhopadhyay, Scott Sprague, Alaina J McGrath, John W Kramer, et al. Novel strategy for photopatterning emissive polymer brushes for organic light emitting diode applications. *ACS central science*, 3(6):654–661, 2017.
- [85] Rui Wang, Qiangbing Wei, Wenbo Sheng, Bo Yu, Feng Zhou, and Bin Li. Driving polymer brushes from synthesis to functioning. *Angewandte Chemie International Edition*, 62(27):e202219312, 2023.
- [86] Haofeng Qiu, Zhangyong Si, Yang Luo, Peipei Feng, Xujin Wu, Wenjia Hou, Yabin Zhu, Mary B Chan-Park, Long Xu, and Dongmei Huang. The mechanisms and the applications of antibacterial polymers in surface modification on medical devices. *Frontiers in bioengineering and biotechnology*, 8:910, 2020.
- [87] Anna MC Maan, Anton H Hofman, Wiebe M de Vos, and Marleen Kamperman. Recent developments and practical feasibility of polymer-based antifouling coatings. *Advanced functional materials*, 30(32):2000936, 2020.
- [88] Shaifali Dhingra, Vidit Gaur, Jayanta Bhattacharya, and Sampa Saha. Photoinduced micropatterning on biodegradable aliphatic polyester surfaces for anchoring dual brushes and its application in bacteria and cell patterning. *Journal of Materials Chemistry B*, 11(1):83–98, 2023.
- [89] Jayanta Kumar Patra, Gitishree Das, Leonardo Fernandes Fraceto, Estefania Vangelie Ramos Campos, Maria del Pilar Rodriguez-Torres, Laura Susana Acosta-Torres, Luis Armando Diaz-Torres, Renato Grillo, Mallappa Kumara Swamy, Shivesh Sharma, et al. Nano based drug delivery systems: recent developments and future prospects. *Journal of nanobiotechnology*, 16:1–33, 2018.

- [90] Danyang Li, Amir S Sharili, John Connelly, and Julien E Gautrot. Highly stable rna capture by dense cationic polymer brushes for the design of cytocompatible, serum-stable sirna delivery vectors. *Biomacromolecules*, 19(2):606–615, 2018.
- [91] Rohini Thevi Guntnur, Nicolas Muzzio, Amanda Gomez, Sean Macias, Arturo Galindo, Arturo Ponce, and Gabriela Romero. On-demand chemomagnetic modulation of striatal neurons facilitated by hybrid magnetic nanoparticles. *Advanced functional materials*, 32(35):2204732, 2022.
- [92] Wei Wu, Jianxi Liu, Lejie Tian, Xiao Lin, Huidan Xue, Peiwei Gong, Feng Zhou, and Weimin Liu. Polyelectrolyte-functionalized nanomofs for highly efficient aqueous lubrication and sustained drug release. *Macromolecular Rapid Communications*, 44(13):2300089, 2023.
- [93] Malihe Pooresmaeil and Hassan Namazi. Surface modification of graphene oxide with stimuli-responsive polymer brush containing  $\beta$ -cyclodextrin as a pendant group: Preparation, characterization, and evaluation as controlled drug delivery agent. *Colloids and Surfaces B: Biointerfaces*, 172:17–25, 2018.
- [94] Abeer M Beagan, Ahlam A Alghamdi, Shatha S Lahmadi, Majed A Halwani, Mohammed S Almeataq, Abdulaziz N Alhazaa, Khalid M Alotaibi, and Abdullah M Alswieleh. Folic acid-terminated poly (2-diethyl amino ethyl methacrylate) brush-gated magnetic mesoporous nanoparticles as a smart drug delivery system. *Polymers*, 13(1):59, 2020.
- [95] Shuai Chen, Qixian Chen, Shuqi Dong, Jianbiao Ma, Ying-Wei Yang, Li Chen, and Hui Gao. Polymer brush decorated mof nanoparticles loaded with aiegen, anticancer drug, and supramolecular glue for regulating and in situ observing dox release. *Macromolecular Bioscience*, 18(12):1800317, 2018.
- [96] Mark EJ Newman and Gerard T Barkema. *Monte Carlo methods in statistical physics*. Clarendon Press, 1999.
- [97] Fa-Yueh Wu. The potts model. *Reviews of modern physics*, 54(1):235, 1982.
- [98] Roy J Glauber. Time-dependent statistics of the ising model. *Journal of mathematical physics*, 4(2):294–307, 1963.
- [99] Awaneesh Singh, A Mukherjee, HM Vermeulen, GT Barkema, and Sanjay Puri. Control of structure formation in phase-separating systems. *The Journal of Chemical Physics*, 134(4), 2011.
- [100] Nicolaas Godfried Van Kampen. *Stochastic processes in physics and chemistry*, volume 1. Elsevier, 1992.
- [101] Yoshitsugu Oono and Sanjay Puri. Study of phase-separation dynamics by use of cell dynamical systems. i. modeling. *Physical Review A*, 38(1):434, 1988.
- [102] Awaneesh Singh and Sanjay Puri. Phase separation in ternary fluid mixtures: a molecular dynamics study. *Soft matter*, 11(11):2213–2219, 2015.
- [103] Andr Guinier, Grard Fournet, Christopher B Walker, and Kenneth L Yudowitch. *Small-angle Scattering of X-rays*. Wiley New York, 1955.
- [104] Bruce J Berne and Robert Pecora. *Dynamic light scattering: with applications to chemistry, biology, and physics*. Courier Corporation, 2000.
- [105] Brian M Tande, Norman J Wagner, Michael E Mackay, Craig J Hawker, and Miyoun Jeong. Viscosimetric, hydrodynamic, and conformational properties of dendrimers and dendrons. *Macromolecules*, 34(24):8580–8585, 2001.
- [106] Mohammed Baalousha, Franck VD Kammer, Mikael Motelica-Heino, Hikmat S Hilal, and Philippe Le Coustumer. Size fractionation and characterization of natural colloids by flow-field flow fractionation coupled to multi-angle laser light scattering. *Journal of Chromatography A*, 1104(1-2):272–281, 2006.
- [107] Walther Burchard. Solution properties of branched macromolecules. *Branched polymers II*, pages 113–194, 1999.

- [108] Jin-Wook Yoo, Darrell J Irvine, Dennis E Discher, and Samir Mitragotri. Bio-inspired, bioengineered and biomimetic drug delivery carriers. *Nature reviews Drug discovery*, 10(7):521–535, 2011.
- [109] Stefano Sacanna and David J Pine. Shape-anisotropic colloids: Building blocks for complex assemblies. *Current opinion in colloid & interface science*, 16(2):96–105, 2011.
- [110] Sampa Saha, Davor Copic, Srijanani Bhaskar, Nicholas Clay, Alessandro Donini, A John Hart, and Joerg Lahann. Chemically controlled bending of compositionally anisotropic microcylinders. *Angewandte Chemie - International Edition*, 51(3):660–665, 2012.
- [111] Sahar Rahmani, Sampa Saha, Hakan Durmaz, Alessandro Donini, Asish C Misra, Jaewon Yoon, and Joerg Lahann. Chemically orthogonal three-patch microparticles. *Angewandte Chemie International Edition*, 53(9):2332–2338, 2014.
- [112] Randall A Meyer, Mohit P Mathew, Elana Ben-Akiva, Joel C Sunshine, Ron B Shmueli, Qiuyin Ren, Kevin J Yarema, and Jordan J Green. Anisotropic biodegradable lipid coated particles for spatially dynamic protein presentation. *Acta biomaterialia*, 72:228–238, 2018.
- [113] P Decuzzi, Biana Godin, T Tanaka, S-Y Lee, C Chiappini, X Liu, and MJOCR Ferrari. Size and shape effects in the biodistribution of intravascularly injected particles. *Journal of Controlled Release*, 141(3):320–327, 2010.
- [114] Anil B Jindal. The effect of particle shape on cellular interaction and drug delivery applications of micro-and nanoparticles. *International journal of pharmaceuticals*, 532(1):450–465, 2017.
- [115] Bryan Ronain Smith, Paul Kempen, Donna Bouley, Alexander Xu, Zhuang Liu, Nicholas Melosh, Hongjie Dai, Robert Sinclair, and Sanjiv Sam Gambhir. Shape matters: intravital microscopy reveals surprising geometrical dependence for nanoparticles in tumor models of extravasation. *Nano letters*, 12(7):3369–3377, 2012.
- [116] Vikash P Chauhan, Zoran Popović, Ou Chen, Jian Cui, Dai Fukumura, Mounqi G Bawendi, and Rakesh K Jain. Fluorescent nanorods and nanospheres for real-time in vivo probing of nanoparticle shape-dependent tumor penetration. *Angewandte Chemie International Edition*, 50(48):11417–11420, 2011.
- [117] Wei Li, Toyoko Suzuki, and Hideto Minami. The interface adsorption behavior in a pickering emulsion stabilized by cylindrical polystyrene particles. *Journal of colloid and interface science*, 552:230–235, 2019.
- [118] B Heidarshenas, H Wei, Z Moghimi, G Hussain, F Baniasadi, and G Naghieh. Nanowires in magnetic drug targeting. *Mater. Sci. Eng. Int. J*, 3:3–9, 2019.
- [119] Jun Chen, Veronika Kozlovskaya, Allison Goins, Javier Campos-Gomez, Mohammad Saeed, and Eugenia Kharlampieva. Biocompatible shaped particles from dried multilayer polymer capsules. *Biomacromolecules*, 14(11):3830–3841, 2013.
- [120] Nishit Doshi, Balabhaskar Prabhakarparandian, Angela Rea-Ramsey, Kapil Pant, Shivshankar Sundaram, and Samir Mitragotri. Flow and adhesion of drug carriers in blood vessels depend on their shape: a study using model synthetic microvascular networks. *Journal of Controlled Release*, 146(2):196–200, 2010.
- [121] Samar Shah, Yaling Liu, Walter Hu, and Jinming Gao. Modeling particle shape-dependent dynamics in nanomedicine. *Journal of nanoscience and nanotechnology*, 11(2):919–928, 2011.
- [122] Marta Alvarez-Paino, Mahetab H Amer, Aishah Nasir, Valentina Cuzzucoli Crucitti, Jordan Thorpe, Laurence Burroughs, David Needham, Chris Denning, Morgan R Alexander, Cameron Alexander, et al. Polymer microparticles with defined surface chemistry and topography mediate the formation of stem cell aggregates and cardiomyocyte function. *ACS applied materials & interfaces*, 11(38):34560–34574, 2019.
- [123] Ifra, Awaneesh Singh, and Sampa Saha. Shape shifting of cup shaped particles on growing poly (2-hydroxy ethyl methacrylate) brushes by “grafting from” approach and dissipative particle dynamics simulation. *ChemistrySelect*, 5(15):4685–4694, 2020.

- [124] Ifra, Aiswarya Thattaru Thodikayil, and Sampa Saha. Compositionally anisotropic colloidal surfactant decorated with dual metallic nanoparticles as a pickering emulsion stabilizer and their application in catalysis. *ACS Applied Materials & Interfaces*, 14(20):23436–23451, 2022.
- [125] Hyonchol Kim, Hideyuki Terazono, Hiroyuki Takei, and Kenji Yasuda. Cup-shaped superparamagnetic hemispheres for size-selective cell filtration. *Scientific reports*, 4(1):6362, 2014.
- [126] Suguna Jairam, Zhaohui Tong, Letian Wang, and Bruce Welt. Encapsulation of a biobased lignin-saponite nanohybrid into polystyrene co-butyl acrylate (psba) latex via miniemulsion polymerization. *Acs Sustainable Chemistry & Engineering*, 1(12):1630–1637, 2013.
- [127] Zhaohui Tong and Yulin Deng. Synthesis of polystyrene encapsulated nanosaponite composite latex via miniemulsion polymerization. *Polymer*, 48(15):4337–4343, 2007.
- [128] Lei Wang, Yijing Liu, Jie He, Matthew J Hourwitz, Yunlong Yang, John T Fourkas, Xiaojun Han, and Zhihong Nie. Continuous microfluidic self-assembly of hybrid janus-like vesicular motors: autonomous propulsion and controlled release. *Small*, 11(31):3762–3767, 2015.
- [129] Shuang Li, Xiaofeng Yang, Shuai Yang, Muzi Zhu, and Xiaoning Wang. Technology prospecting on enzymes: application, marketing and engineering. *Computational and structural biotechnology journal*, 2(3):e201209017, 2012.
- [130] Saurabh Bhatia and S Bhatia. Introduction to enzymes and their applications. *Introduction to pharmaceutical biotechnology*, 2:1–29, 2018.
- [131] Sindhu Raveendran, Binod Parameswaran, Sabeela Beevi Ummalyma, Amith Abraham, Anil Kuruvilla Mathew, Aravind Madhavan, Sharrel Rebello, and Ashok Pandey. Applications of microbial enzymes in food industry. *Food technology and biotechnology*, 56(1):16–30, 2018.
- [132] Yu-Ke Cen, Yu-Xiao Liu, Ya-Ping Xue, and Yu-Guo Zheng. Immobilization of enzymes in/on membranes and their applications. *Advanced Synthesis & Catalysis*, 361(24):5500–5515, 2019.
- [133] Dong-Mei Liu, Juan Chen, and Yan-Ping Shi.  $\alpha$ -glucosidase immobilization on chitosan-modified cellulose filter paper: Preparation, property and application. *International journal of biological macromolecules*, 122:298–305, 2019.
- [134] Nur Royhaila Mohamad, Nur Haziqah Che Marzuki, Nor Aziah Buang, Fahrul Huyop, and Roswanira Abdul Wahab. An overview of technologies for immobilization of enzymes and surface analysis techniques for immobilized enzymes. *Biotechnology & Biotechnological Equipment*, 29(2):205–220, 2015.
- [135] Gustav Ferrand-Drake del Castillo, Meike Koenig, Martin Muller, Klaus-Jochen Eichhorn, Manfred Stamm, Petra Uhlmann, and Andreas Dahlin. Enzyme immobilization in polyelectrolyte brushes: High loading and enhanced activity compared to monolayers. *Langmuir*, 35(9):3479–3489, 2019.
- [136] B Haupt, Th Neumann, Alexander Wittmann, and Matthias Ballauff. Activity of enzymes immobilized in colloidal spherical polyelectrolyte brushes. *Biomacromolecules*, 6(2):948–955, 2005.
- [137] Jakub Zdarta, Anne S Meyer, Teofil Jesionowski, and Manuel Pinelo. A general overview of support materials for enzyme immobilization: characteristics, properties, practical utility. *Catalysts*, 8(2):92, 2018.
- [138] Barbara Krajewska. Application of chitin-and chitosan-based materials for enzyme immobilizations: a review. *Enzyme and microbial technology*, 35(2-3):126–139, 2004.
- [139] Marie Hoarau, Somayesadat Badiyan, and E Neil G Marsh. Immobilized enzymes: understanding enzyme-surface interactions at the molecular level. *Organic & Biomolecular Chemistry*, 15(45):9539–9551, 2017.
- [140] Claudia Marschelke, Ivan Raguzin, Anke Matura, Andreas Fery, and Alla Synytska. Controlled and tunable design of polymer interface for immobilization of enzymes: does curvature matter? *Soft Matter*, 13(5):1074–1084, 2017.

- [141] Claudia Marschelke, Martin Muller, Dorina Kopke, Anke Matura, Marco Sallat, and Alla Synytska. Hairy particles with immobilized enzymes: impact of particle topology on the catalytic activity. *ACS applied materials & interfaces*, 11(1):1645–1654, 2018.
- [142] Andy Kusumo, Lindsay Bombalski, Qiao Lin, Krzysztof Matyjaszewski, James W Schneider, and Robert D Tilton. High capacity, charge-selective protein uptake by polyelectrolyte brushes. *Langmuir*, 23(8):4448–4454, 2007.
- [143] Parul Jain, Jinhua Dai, Sebastian Grajales, Sampa Saha, Gregory L Baker, and Merlin L Bruening. Completely aqueous procedure for the growth of polymer brushes on polymeric substrates. *Langmuir*, 23(23):11360–11365, 2007.
- [144] AG Schlijper, PJ Hoogerbrugge, and CW Manke. Computer simulation of dilute polymer solutions with the dissipative particle dynamics method. *Journal of Rheology*, 39(3):567–579, 1995.
- [145] NA Spenley. Scaling laws for polymers in dissipative particle dynamics. *Europhysics Letters*, 49(4):534–540, 2000.
- [146] Karel Prochazka, Zuzana Limpouchova, Miroslav Stepanek, Karel Sindelka, and Martin Lisal. Dpd modelling of the self-and co-assembly of polymers and polyelectrolytes in aqueous media: Impact on polymer science. *Polymers*, 14(3):404, 2022.
- [147] Martin Lisal, Zuzana Limpouchova, and Karel Prochazka. The self-assembly of copolymers with one hydrophobic and one polyelectrolyte block in aqueous media: a dissipative particle dynamics study. *Physical Chemistry Chemical Physics*, 18(24):16127–16136, 2016.
- [148] Robert D Groot. Electrostatic interactions in dissipative particle dynamics simulation of polyelectrolytes and anionic surfactants. *The Journal of chemical physics*, 118(24):11265–11277, 2003.
- [149] Frederick Jean-Marie De Meyer, Maddalena Venturoli, and Berend Smit. Molecular simulations of lipid-mediated protein-protein interactions. *Biophysical journal*, 95(4):1851–1865, 2008.
- [150] Robert D Groot and KL Rabone. Mesoscopic simulation of cell membrane damage, morphology change and rupture by nonionic surfactants. *Biophysical journal*, 81(2):725–736, 2001.
- [151] Yong-Lei Wang, Zhong-Yuan Lu, and Aatto Laaksonen. Specific binding structures of dendrimers on lipid bilayer membranes. *Physical Chemistry Chemical Physics*, 14(23):8348–8359, 2012.
- [152] Aleksey Vishnyakov, David S Talaga, and Alexander V Neimark. Dpd simulation of protein conformations: From  $\alpha$ -helices to  $\beta$ -structures. *The journal of physical chemistry letters*, 3(21):3081–3087, 2012.
- [153] ACC Esteves, K Lyakhova, LGJ Van Der Ven, RATM Van Benthem, and G De With. Surface segregation of low surface energy polymeric dangling chains in a cross-linked polymer network investigated by a combined experimental–simulation approach. *Macromolecules*, 46(5):1993–2002, 2013.
- [154] Deep Chanchal and Saraf Swarnlata. Novel approaches in herbal cosmetics. *Journal of cosmetic dermatology*, 7(2):89–95, 2008.
- [155] Danhua Xie, Yulong Jiang, Kangling Li, Xinyue Yang, and Yunjin Zhang. Pickering emulsions stabilized by mesoporous nanoparticles with different morphologies in combination with dtab. *ACS omega*, 7(33):29153–29160, 2022.
- [156] Iva Kralova and Johan Sjöblom. Surfactants used in food industry: a review. *Journal of Dispersion Science and Technology*, 30(9):1363–1383, 2009.
- [157] Demet Guzey and D Julian McClements. Formation, stability and properties of multilayer emulsions for application in the food industry. *Advances in colloid and interface science*, 128:227–248, 2006.
- [158] Fulden Buyukozturk, James C Benneyan, and Rebecca L Carrier. Impact of emulsion-based drug delivery systems on intestinal permeability and drug release kinetics. *Journal of controlled release*, 142(1):22–30, 2010.

- [159] MN Yukuyama, Daniela Dal Molim Ghisleni, Terezinha de Jesus Andreoli Pinto, and Nadia Araci Bou-Chacra. Nanoemulsion: process selection and application in cosmetics—a review. *International journal of cosmetic science*, 38(1):13–24, 2016.
- [160] Anu Puri, Kristin Loomis, Brandon Smith, Jae-Ho Lee, Amichai Yavlovich, Eliahu Heldman, and Robert Blumenthal. Lipid-based nanoparticles as pharmaceutical drug carriers: from concepts to clinic. *Critical Reviews™ in Therapeutic Drug Carrier Systems*, 26(6), 2009.
- [161] David Julian McClements. *Food emulsions: principles, practices, and techniques, third edition*. CRC press, 2015.
- [162] David Julian McClements. Edible nanoemulsions: fabrication, properties, and functional performance. *Soft matter*, 7(6):2297–2316, 2011.
- [163] Jacob N Israelachvili. *Intermolecular and surface forces*. Academic press, 2011.
- [164] Egon Matijević. Principles of colloid and surface chemistry. *Journal of Colloid and Interface Science*, 70(2):399, 1979.
- [165] David Julian McClements and Cansu Ekin Gumus. Natural emulsifiers—biosurfactants, phospholipids, biopolymers, and colloidal particles: Molecular and physicochemical basis of functional performance. *Advances in Colloid and interface Science*, 234:3–26, 2016.
- [166] Gerard L Hasenhuettl. Overview of food emulsifiers. *Food emulsifiers and their applications*, pages 1–9, 2019.
- [167] Bum Jun Park, Teresa Brugarolas, and Daeyeon Lee. Janus particles at an oil–water interface. *Soft Matter*, 7(14):6413–6417, 2011.
- [168] Amar B Pawar and Ilona Kretzschmar. Fabrication, assembly, and application of patchy particles. *Macromolecular rapid communications*, 31(2):150–168, 2010.
- [169] Sumit Gangwal, Olivier J Cayre, and Orlin D Velev. Dielectrophoretic assembly of metallodielectric janus particles in ac electric fields. *Langmuir*, 24(23):13312–13320, 2008.
- [170] Sumit Gangwal, Amar Pawar, Ilona Kretzschmar, and Orlin D Velev. Programmed assembly of metallodielectric patchy particles in external ac electric fields. *Soft Matter*, 6(7):1413–1418, 2010.
- [171] Colloidal particles at liquid interfaces. *Phys. Chem. Chem. Phys.*, 9:6298–6299, 2007.
- [172] Jin-Woong Kim, Daeyeon Lee, Ho Cheung Shum, and David A Weitz. Colloid surfactants for emulsion stabilization. *Advanced materials*, 20(17):3239–3243, 2008.
- [173] Shan Jiang, Qian Chen, Mukta Tripathy, Erik Luijten, Kenneth S Schweizer, and Steve Granick. Janus particle synthesis and assembly. *Advanced materials*, 22(10):1060–1071, 2010.
- [174] BP Binks and PDI Fletcher. Particles adsorbed at the oil- water interface: A theoretical comparison between spheres of uniform wettability and “janus” particles. *Langmuir*, 17(16):4708–4710, 2001.
- [175] Shan Jiang and Steve Granick. Janus balance of amphiphilic colloidal particles. *The Journal of chemical physics*, 127(16), 2007.
- [176] Y Hirose, S Komura, and Y Nonomura. Adsorption of janus particles to curved interfaces. *The Journal of chemical physics*, 127(5):054707, 2007.
- [177] David L Cheung and Stefan AF Bon. Stability of janus nanoparticles at fluid interfaces. *Soft Matter*, 5(20):3969–3976, 2009.
- [178] Nicholas Ballard and Stefan AF Bon. Hybrid biological spores wrapped in a mesh composed of interpenetrating polymer nanoparticles as “patchy” pickering stabilizers. *Polymer Chemistry*, 2(4):823–827, 2011.

- [179] Nicole Glaser, Dave J Adams, Alexander Boker, and Georg Krausch. Janus particles at liquid- liquid interfaces. *Langmuir*, 22(12):5227–5229, 2006.
- [180] Andreas Walther, Martin Hoffmann, and AH Muller. Emulsion polymerization using janus particles as stabilizers. *ANGEWANDTE CHEMIE-INTERNATIONAL EDITION IN ENGLISH*, 47(4):711, 2008.
- [181] Yosadara Ruiz-Morales and Fernando Alvarez-Ramirez. Mesoscale dissipative particle dynamics to investigate oil asphaltenes and sodium naphthenates at the oil- water interface. *Energy & Fuels*, 35(11):9294–9311, 2021.
- [182] Yosadara Ruiz-Morales and Oliver C Mullins. Coarse-grained molecular simulations to investigate asphaltenes at the oil-water interface. *Energy & Fuels*, 29(3):1597–1609, 2015.
- [183] Shuyan Wang, Shanwen Yang, Ruichen Wang, Ruichao Tian, Xiaoyu Zhang, Qiji Sun, and Lili Liu. Dissipative particle dynamics study on the temperature dependent interfacial tension in surfactant-oil-water mixtures. *Journal of Petroleum Science and Engineering*, 169:81–95, 2018.
- [184] Martin Andresen and Per Stenius. Water-in-oil emulsions stabilized by hydrophobized microfibrillated cellulose. *Journal of Dispersion Science and Technology*, 28(6):837–844, 2007.
- [185] Ilke Akartuna, André R Studart, Elena Tervoort, Urs T Gonzenbach, and Ludwig J Gauckler. Stabilization of oil-in-water emulsions by colloidal particles modified with short amphiphiles. *Langmuir*, 24(14):7161–7168, 2008.
- [186] Jing Hu, Shuxue Zhou, Yangyi Sun, Xiaosheng Fang, and Limin Wu. Fabrication, properties and applications of janus particles. *Chemical Society Reviews*, 41(11):4356–4378, 2012.
- [187] Jang Min Park, Roberto Mauri, and Patrick D Anderson. Phase separation of viscous ternary liquid mixtures. *Chemical engineering science*, 80:270–278, 2012.
- [188] Takeji Hashimoto, Masahiko Itakura, and Hirokazu Hasegawa. Late stage spinodal decomposition of a binary polymer mixture. i. critical test of dynamical scaling on scattering function. *The Journal of chemical physics*, 85(10):6118–6128, 1986.
- [189] Jyotsana Lal and Rama Bansil. Light-scattering study of kinetics of spinodal decomposition in a polymer solution. *Macromolecules*, 24(1):290–297, 1991.
- [190] Y Oono and S Puri. Large wave number features of form factors for phase transition kinetics. *Modern Physics Letters B*, 2(07):861–867, 1988.
- [191] Kumela Tafa, Sanjay Puri, and Deepak Kumar. Kinetics of phase separation in ternary mixtures. *Physical Review E*, 64(5):056139, 2001.
- [192] Sushanta Dattagupta and Sanjay Puri. *Dissipative phenomena in condensed matter: some applications*, volume 71. Springer Science & Business Media, 2013.
- [193] Live Rekvig, Marieke Kranenburg, Jocelyne Vreede, Bjørn Hafskjold, and Berend Smit. Investigation of surfactant efficiency using dissipative particle dynamics. *Langmuir*, 19(20):8195–8205, 2003.
- [194] Robert D Groot and Timothy J Madden. Dynamic simulation of diblock copolymer microphase separation. *The Journal of chemical physics*, 108(20):8713–8724, 1998.
- [195] Avinash Chauhan, Dorothy Gogoi, Sanjay Puri, and Awaneesh Singh. Effect of amphiphilic polymers on phase separating binary mixtures: A dpd simulation study. *The Journal of Chemical Physics*, 159(20), 2023.
- [196] Timothy W Sirk, Yelena R Slizoberg, John K Brennan, Martin Lisal, and Jan W Andzelm. An enhanced entangled polymer model for dissipative particle dynamics. *The Journal of chemical physics*, 136(13), 2012.

- [197] Koyel Das and Subir K Das. Hydrodynamic effects in kinetics of phase separation in binary fluids: Critical versus off-critical compositions. *Physical Review E*, 107(4):044116, 2023.
- [198] Fatemeh Goodarzi and Sohrab Zendehboudi. A comprehensive review on emulsions and emulsion stability in chemical and energy industries. *The Canadian Journal of Chemical Engineering*, 97(1):281–309, 2019.
- [199] Tanvi Sheth, Serena Seshadri, Tamás Prileszky, and Matthew E Helgeson. Multiple nanoemulsions. *Nature Reviews Materials*, 5(3):214–228, 2020.
- [200] Ivan B Ivanov and Peter A Kralchevsky. Stability of emulsions under equilibrium and dynamic conditions. *Colloids and Surfaces A: Physicochemical and engineering aspects*, 128(1-3):155–175, 1997.
- [201] William Wachira Mwangi, Kiang-Wei Ho, Beng-Ti Tey, and Eng-Seng Chan. Effects of environmental factors on the physical stability of pickering-emulsions stabilized by chitosan particles. *Food Hydrocolloids*, 60:543–550, 2016.
- [202] Arya Das and Sk Musharaf Ali. Understanding of interfacial tension and interface thickness of liquid/liquid interface at a finite concentration of alkyl phosphate by molecular dynamics simulation. *Journal of Molecular Liquids*, 277:217–232, 2019.
- [203] David Steinmetz, Benoit Creton, Véronique Lachet, Bernard Rousseau, and Carlos Nieto-Draghi. Simulations of interfacial tension of liquid–liquid ternary mixtures using optimized parametrization for coarse-grained models. *Journal of chemical theory and computation*, 14(8):4438–4454, 2018.
- [204] Asish C Misra and Joerg Lahann. Progress of multicompartmental particles for medical applications. *Advanced healthcare materials*, 7(9):1701319, 2018.
- [205] Jaeyun Kim, Dian R Arifin, Naser Muja, Taeho Kim, Assaf A Gilad, Heechul Kim, Aravind Arepally, Taeghwan Hyeon, and Jeff WM Bulte. Multifunctional capsule-in-capsules for immunoprotection and trimodal imaging. *Angewandte Chemie International Edition*, 50(10):2317–2321, 2011.
- [206] Daniel C Pregibon, Mehmet Toner, and Patrick S Doyle. Multifunctional encoded particles for high-throughput biomolecule analysis. *Science*, 315(5817):1393–1396, 2007.
- [207] Soumyadip Dutta, Nehil Shreyash, Bhabani Kumar Satapathy, and Sampa Saha. Advances in design of polymer brush functionalized inorganic nanomaterials and their applications in biomedical arena. *Wiley Interdisciplinary Reviews: Nanomedicine and Nanobiotechnology*, 15(3):e1861, 2023.
- [208] Fuqiang Chang, Samia Ouhajji, Alice Townsend, Kanvaly Sanogo Lacina, Bas GP van Ravensteijn, and Willem K Kegel. Controllable synthesis of patchy particles with tunable geometry and orthogonal chemistry. *Journal of Colloid and Interface Science*, 582:333–341, 2021.
- [209] Haoguan Gui, Yuanyuan Li, Deming Du, Qing Bo Meng, Xi-Ming Song, and Fuxin Liang. Preparation of asymmetric particles by controlling the phase separation of seeded emulsion polymerization with ethanol/water mixture. *Journal of Colloid and Interface Science*, 618:496–506, 2022.
- [210] Sampa Saha et al. Fabrication of topologically anisotropic microparticles and their surface modification with ph responsive polymer brush. *Materials Science and Engineering: C*, 104:109894, 2019.
- [211] Zhu Sun, Xiaoxiao Yan, Yao Xiao, Lingjie Hu, Max Eggersdorfer, Dong Chen, Zhenzhong Yang, and David A Weitz. Pickering emulsions stabilized by colloidal surfactants: Role of solid particles. *Particuology*, 64:153–163, 2022.
- [212] Hengquan Yang, Luman Fu, Lijuan Wei, Jifen Liang, and Bernard P Binks. Compartmentalization of incompatible reagents within pickering emulsion droplets for one-pot cascade reactions. *Journal of the American Chemical Society*, 137(3):1362–1371, 2015.
- [213] Juntao Tang, Patrick James Quinlan, and Kam Chiu Tam. Stimuli-responsive pickering emulsions: recent advances and potential applications. *Soft Matter*, 11(18):3512–3529, 2015.

- [214] Meenakshi Dutt, Olga Kuksenok, Michael J Nayhouse, Steven R Little, and Anna C Balazs. Modeling the self-assembly of lipids and nanotubes in solution: forming vesicles and bicelles with transmembrane nanotube channels. *ACS nano*, 5(6):4769–4782, 2011.
- [215] Aidan P Thompson, H Metin Aktulga, Richard Berger, Dan S Bolintineanu, W Michael Brown, Paul S Crozier, Pieter J In't Veld, Axel Kohlmeyer, Stan G Moore, Trung Dac Nguyen, et al. LAMMPS—a flexible simulation tool for particle-based materials modeling at the atomic, meso, and continuum scales. *Computer Physics Communications*, 271:108171, 2022.
- [216] Amrita Singh, Anirban Chakraborti, and Awaneesh Singh. Role of a polymeric component in the phase separation of ternary fluid mixtures: a dissipative particle dynamics study. *Soft Matter*, 14(21):4317–4326, 2018.
- [217] Awaneesh Singh, Amrita Singh, and Anirban Chakraborti. Effect of bond-disorder on the phase-separation kinetics of binary mixtures: A monte carlo simulation study. *The Journal of Chemical Physics*, 147(12), 2017.
- [218] Suman Majumder, Subir K Das, and Wolfhard Janke. Universal finite-size scaling function for kinetics of phase separation in mixtures with varying number of components. *Physical Review E*, 98(4):042142, 2018.
- [219] Ramgopal Agrawal, Manoj Kumar, and Sanjay Puri. Domain growth and aging in the random field  $x$   $y$  model: A monte carlo study. *Physical Review E*, 104(4):044123, 2021.
- [220] Michio Tateno and Hajime Tanaka. Power-law coarsening in network-forming phase separation governed by mechanical relaxation. *Nature communications*, 12(1):912, 2021.
- [221] H Manzanarez, JP Mericq, P Guenoun, and D Bouyer. Modeling the interplay between solvent evaporation and phase separation dynamics during membrane. *Journal of Membrane Science*, 620:118941, 2021.
- [222] Awaneesh Singh. Kinetics of domain growth in ising systems with bond disorder at regularly selected sites. *Bulletin of Materials Science*, 43(1):185, 2020.
- [223] H Ikeda, Y Endoh, and S Itoh. Ordering kinetics in a two-dimensional percolation magnet. *Physical review letters*, 64(11):1266, 1990.
- [224] V Likodimos, M Labardi, and Maria Allegrini. Kinetics of ferroelectric domains investigated by scanning force microscopy. *Physical Review B*, 61(21):14440, 2000.
- [225] V Likodimos, M Labardi, XK Orlik, Lucio Pardi, Maria Allegrini, S Emonin, and O Marti. Thermally activated ferroelectric domain growth due to random defects. *Physical Review B*, 63(6):064104, 2001.
- [226] AJ Bray and K Humayun. Universality class for domain growth in random magnets. *Journal of Physics A: Mathematical and General*, 24(19):L1185, 1991.
- [227] EF Sarmiento and T Kaneyoshi. Phase transition of transverse ising model in a random field. *Physical Review B*, 39(13):9555, 1989.
- [228] M Jaščur and T Kaneyoshi. Spin-32 ising model in a random field. *Physica A: Statistical Mechanics and its Applications*, 195(3-4):497–505, 1993.
- [229] T Kaneyoshi. The tricritical point in ising models with random bonds and crystal-field interactions. *Journal of Physics C: Solid State Physics*, 19(25):L557, 1986.
- [230] David J Srolovitz and Gary S Grest. Impurity effects on domain-growth kinetics. ii. potts model. *Physical Review B*, 32(5):3021, 1985.
- [231] Gary S Grest and David J Srolovitz. Impurity effects on domain-growth kinetics. i. ising model. *Physical review B*, 32(5):3014, 1985.

- [232] Debashish Chowdhury, Martin Grant, and JD Gunton. Interface roughening and domain growth in the dilute ising model. *Physical Review B*, 35(13):6792, 1987.
- [233] Kyohei Takae and Hajime Tanaka. Role of hydrodynamics in liquid–liquid transition of a single-component substance. *Proceedings of the National Academy of Sciences*, 117(9):4471–4479, 2020.
- [234] Jun Fan, Tao Han, and Mikko Haataja. Hydrodynamic effects on spinodal decomposition kinetics in planar lipid bilayer membranes. *The Journal of chemical physics*, 133(23):235101, 2010.
- [235] Raja Paul, Sanjay Puri, and Heiko Rieger. Domain growth in ising systems with quenched disorder. *Physical Review E—Statistical, Nonlinear, and Soft Matter Physics*, 71(6):061109, 2005.
- [236] Raja Paul, Sanjay Puri, and Heiko Rieger. Domain growth in random magnets. *Europhysics Letters*, 68(6):881, 2004.
- [237] SANJAY Puri, DEBASHISH Chowdhury, and NITA Parekh. Non-algebraic domain growth in random magnets: a cell dynamical approach. *Journal of Physics A: Mathematical and General*, 24(18):L1087, 1991.
- [238] Ilya M Lifshitz and Vitaly V Slyozov. The kinetics of precipitation from supersaturated solid solutions. *Journal of physics and chemistry of solids*, 19(1-2):35–50, 1961.
- [239] Awaneesh Singh, Sanjay Puri, and Chandan Dasgupta. Kinetics of phase separation in polymer mixtures: A molecular dynamics study. *The Journal of Chemical Physics*, 140(24), 2014.
- [240] Tsuyoshi Koga and Kyozi Kawasaki. Spinodal decomposition in binary fluids: Effects of hydrodynamic interactions. *Physical Review A*, 44(2):R817, 1991.
- [241] VM Kendon, JC Desplat, P Bladon, and ME Cates. 3d spinodal decomposition in the inertial regime. *Physical Review Letters*, 83(3):576, 1999.
- [242] Jong Hoon Oh and Duk-In Choi. Monte carlo study of the domain kinetics of the ising model with random coupling constants. *Physical Review B*, 33(5):3448, 1986.
- [243] S Puri and N Parekh. Non-algebraic domain growth in binary alloys with quenched disorder. *Journal of Physics A: Mathematical and General*, 25(15):4127, 1992.
- [244] T Nattermann and J Villain. Random-field ising systems: A survey of current theoretical views. *Phase transitions*, 11(1-4):5–51, 1988.
- [245] AJ Bray and MA Moore. Scaling theory of the random-field ising model. *Journal of Physics C: Solid State Physics*, 18(28):L927, 1985.
- [246] Manoj Kumar, Varsha Banerjee, and Sanjay Puri. Random field ising model with conserved kinetics: Super-universality violation, logarithmic growth law and the generalized tomita sum rule. *Europhysics Letters*, 117(1):10012, 2017.
- [247] A Bupathy, M Kumar, V Banerjee, and S Puri. Random field ising models: fractal interfaces and their implications. In *Journal of Physics: Conference Series*, volume 905, page 012025. IOP Publishing, 2017.
- [248] David A. Huse and Christopher L. Henley. Pinning and roughening of domain walls in ising systems due to random impurities. *Phys. Rev. Lett.*, 54:2708–2711, 1985.
- [249] Sanjay Puri and Harry L Frisch. Phase separation in binary mixtures with chemical reactions. *International Journal of Modern Physics B*, 12(15):1623–1641, 1998.
- [250] Yoshitsugu Oono and Sanjay Puri. Computationally efficient modeling of ordering of quenched phases. *Physical review letters*, 58(8):836, 1987.

- 
- [251] Amitabha Chakrabarti, Raúl Toral, and James D Gunton. Late stages of spinodal decomposition in a three-dimensional model system. *Physical Review B*, 39(7):4386, 1989.
- [252] Suman Majumder and Subir K Das. Temperature and composition dependence of kinetics of phase separation in solid binary mixtures. *Physical Chemistry Chemical Physics*, 15(31):13209–13218, 2013.

## Publications

1. ***Dissipative particle dynamics simulation study on ATRP-brush modification of variably shaped surfaces and biopolymer adsorption-*** Samiksha Shrivastava, Ifra Mirza, Sampa Saha, Awaneesh Singh
2. ***Phase separation kinetics of binary mixture in the influence of bond disorder: sensitivity to quench temperature-***Samiksha Shrivastava,Awaneesh Singh
3. ***Evolution Kinetics of Stabilizing Pickering Emulsion by Brush-Modified Janus Particles: DPD Simulation and Experimental Insights-***Samiksha Shrivastava, Ashank Upadhyay, Subhashree Subhasmita Pradhan, Sampa Saha, Awaneesh Singh
4. ***Oil-in-water emulsion formation via polymer brush-modified tri-compartmental Janus particles-***Subhashree Subhasmita Pradhan, Samiksha Shrivastava, Awaneesh Singh, Sampa Saha
5. ***DPD simulation study of segregation kinetics of binary polymer fluids: external shear effect-*** Ashish Kumar Singh, Samiksha Shrivastava, Awaneesh Singh (Under progress)
6. ***Effect photo-controlled reactions on Self-assembly of charged/uncharged nanorods in phase-separating fluids-*** Samiksha Shrivastava, Awaneesh Singh (Under progress)
7. ***Segregation kinetics of cyclic amphiphilic diblock copolymers via DPD simulation-***Samiksha Shrivastava, Devendra Kumar Verma, Awaneesh Singh (Under progress)
8. ***DPD simulation study on the segregation kinetics of dimers in solution-*** Samiksha Shrivastava, Devendra Kumar Verma, Awaneesh Singh (Under progress)