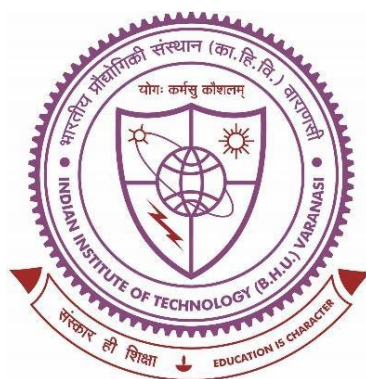


# **Studies on Molecular Insights into Amorphous Systems of Riluzole for Improving Stability, Dissolution and Pharmacokinetic Profile**



**Thesis submitted in partial fulfilment for the Award of Degree**

**Doctor of Philosophy**

**By**

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*Dedicate to almighty and family*

## Acknowledgements

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Kanchan Bharti

## LIST OF ABBREVIATIONS

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<b>ALS</b>	Amyotrophic Lateral Sclerosis
<b>AFM</b>	Atomic Force Microscopy
<b>ALT</b>	Alanine Transaminase
<b>API</b>	Active Pharmaceutical Ingredient
<b>ASD</b>	Amorphous Solid Dispersion
<b>AST</b>	Aspartate Aminotransferase
<b>AUC</b>	Area Under Curve
<b>BCS</b>	Biopharmaceutical Classification System
<b>BW</b>	Body Weight
<b>CCDC</b>	Cambridge Crystallographic Data Centre
<b>CI</b>	Crystallization Inhibitor
<b>C<sub>max</sub></b>	Maximum concentration
<b>CP MAS</b>	Cross Polarization Magic Angle Spinning
<b>CYP</b>	Cytochrome P
<b>DFT</b>	Density Functional Theory
<b>DILI</b>	Drug Induced Liver Injury
<b>DMSO</b>	Dimethyl Sulphoxide
<b>DSC</b>	Differential Scanning Calorimetry
<b>FaSSGF</b>	Fasted Simulated Gastric Fluid
<b>FaSSIF</b>	Fasted Simulated Intestinal Fluid
<b>F<sub>rel</sub></b>	Relative Bioavailability
<b>FTIR</b>	Fourier Transform Infrared
<b>f<sub>u</sub></b>	Unbound or Free Fraction
<b>f<sub>2</sub></b>	Similarity Factor

<b>GI</b>	Gastro-intestinal
<b>GFA</b>	Glass forming ability
<b>GS</b>	Glass stability
<b>H-bond</b>	Hydrogen bond
<b>HME</b>	Hot Melt Extrusion
<b>HPLC</b>	High Performance Liquid Chromatography
<b>HPMC AS</b>	Hydroxypropylmethyl Cellulose Acetate Succinate
<b>PAA</b>	Polyacrylic Acid
<b>PBPK</b>	Physiologically Based Pharmacokinetic
<b>PDA</b>	Photodiode Array
<b>PK</b>	Pharmacokinetics
<b>PLM</b>	Polarized Light Microscope
<b>PM</b>	Physical Mixtures
<b>PRCG</b>	Powell-Reeves conjugate gradient
<b>PVP VA</b>	Polyvinylpyrrolidone Vinyl Acetate
<b>PXRD</b>	Powder X-Ray Diffractometry
<b>R</b>	Universal Gas Constant
<b>RLZ</b>	Riluzole
<b>RLZ-OH</b>	N-hydroxy RLZ
<b>RPM</b>	Rotation Per Minute
<b>NMR</b>	Nuclear Magnetic Resonance
<b>MDS</b>	Molecular Dynamics Simulations
<b>ss-NMR</b>	Solid state- Nuclear Magnetic Resonance
<b>ODE</b>	Ordinary Differential Equations

<b>SAED</b>	Selected Area Electron Diffraction
<b>SEM</b>	Scanning Electron Microscopy
<b>T<sub>g</sub></b>	Glass transition temperature
<b>T<sub>m</sub></b>	Melting temperature
<b>TMS</b>	Tetramethylsilane
<b>TEM</b>	Transmission Electron Microscopy
<b>US FDA</b>	United States Food and Drug Administration
<b>V<sub>max</sub></b>	Maximum Velocity
<b>XPS</b>	X-Ray Photoelectron Spectroscopy
<b>χ</b>	Interaction Parameter
<b>δ</b>	Density
<b>φ</b>	Volume Fraction
<b>ΔG</b>	Gibbs Free Energy
<b>ΔH<sub>f</sub></b>	Heat of Fusion

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