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## Abbreviations

|       |  |
|-------|--|
| AI    | Abrasion Index                                 |
| ASTM  | American Society for Testing and Materials     |
| BHJ   | Banded Hematite Jasper                         |
| BHQ   | Banded Hematite Quartzite                      |
| BIF   | Banded Iron Formation                          |
| BSS   | British Standard Sieve                         |
| Bt    | Billion Tonnes                                 |
| CCS   | Cold Crushing Strength                         |
| CMC   | Carboxy Methyl Cellulose                       |
| cps   | Counts Per Second                              |
| DR    | Direct Reduction                               |
| DRI   | Direct Reduced Iron                            |
| EDS   | Electron Dispersive Spectrometry               |
| eqn.  | Equation                                       |
| FC    | Fixed Carbon                                   |
| GDP   | Gross Domestic Product                         |
| GHG   | Green House Gas                                |
| HCVTM | High Chromium Vanadium Titanium Magnetite      |
| IMMT  | Institute of Minerals and Materials Technology |
| IS    | Indian Standards                               |
| LD    | Linz-Donawitz converter                        |
| LOI   | Loss on Ignition                               |
| M     | Metal  |
| MMO   | Multimetallic Magnetite Ore                    |
| MO    | Metal Oxide                                    |
| Mt    | Million tonnes                                 |
| NEIST | North East Institute of Science and Technology |
| NML   | National Metallurgical Laboratory              |
| OES   | Optical Emission Spectrometry                  |
| RDI   | Reduction Degradation Index                    |
| RO    | Oxide of Reducing agent                        |
| RRL   | Regional Research Laboratory                   |

## Abbreviations

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|      |                              |
|------|------------------------------|
| SEM  | Scanning Electron Microscope |
| SI   | Shatter Index                |
| Temp | Temperature                  |
| TFe  | Total Iron content           |
| TI   | Tumbler Index                |
| UTM  | Universal Testing Machine    |
| VM   | Volatile matter              |
| VTM  | Vanadium Titanium Magnetite  |
| XRD  | X-Ray Diffraction            |
| XRF  | X-Ray Fluorescence           |

## Symbols

|                       |                                   |
|-----------------------|-----------------------------------|
| wt. %                 | Weight percentage                 |
| °C                    | Degree Celsius                    |
| vol. %                | Volume percentage                 |
| %R                    | Percentage Reduction              |
| % Fe <sub>M</sub>     | Percentage Metallization          |
| KJ/mole               | Kilo Joule per mole               |
| $\alpha$              | fraction of reduction             |
| k                     | slope of plotted lines            |
| t                     | time                              |
| Kg, kg                | Kilo gram                         |
| L/min                 | Litre per minute                  |
| H <sub>2</sub> -DRI   | Hydrogen gas Reduced MMO pellets  |
| C-DRI                 | Carbon Reduced MMO pellets        |
| mm                    | Millimeter                        |
| ml                    | Millilitre                        |
| $\mu\text{m}$         | Micrometer                        |
| kV                    | Kilo Volt                         |
| mA                    | Mili Ampere                       |
| $\lambda$             | Wavelength                        |
| mins                  | Minutes                           |
| dia                   | Diameter                          |
| $\rho$                | Density                           |
| gm                    | Grams                             |
| kN                    | Kilo Newton                       |
| Fe(M)                 | Metallic Iron                     |
| Fe(T)                 | Total Iron                        |
| N                     | Normality                         |
| $\Delta G^\circ$      | Standard Free energy of Formation |
| $\Delta G_r$          | Standard Free energy of reaction  |
| R <sup>2</sup> , rsqr | Goodness of Fit                   |
| (g)                   | gas                               |