

LIST OF ABBREVIATIONS AND SYMBOLS

Abbreviation	Description
CO	Castor oil
RO	Rapeseed oil
SO	Sunflower oil
NO	Neemseed oil
CTO	Cottonseed oil
SSO	Sesame oil
OO	Olive oil
PO	Paraffin oil
ZDDP	Zinc dialkyldithiophosphate
WSD	Wear scar diameter
COF	Coefficient of friction
SEM	Scanning electron microscope
AFM	Atomic force microscope
SPM	Scanning probe microscope
EDS	Energy dispersive spectroscopy
TEM	Transmission electron microscope
XRD	X-ray diffractometer
NMR	Nuclear magnetic resonance
GC-MS	Gas chromatography mass spectroscopy
TGA	Thermogravimetric analysis
AW	Antiwear property
AF	Antifriction property

EP	Extreme-pressure property
AISI	American Iron and Steel Institute
ASTM	American society for testing and materials
η_0	Dynamic viscosity
h_{\min}	Minimum film thickness
WR	Wear reduction
τ	Interfacial shear stress
MWV	Mean wear volume
R_q	Line roughness (root mean square)
T_{onset}	Initiation of decomposition (onset) temperature
CCTO	Calcium copper titanate nanoparticle
CeO_2	Cerium oxide nanoparticle
PTFE	Polytetrafluoroethylene
CuO	Copper oxide nanoparticle
SDS	Sodium dodecyl sulfate
S-CuO	Surface treated copper oxide nanoparticles
%w/v	Weight by volume percentage
μm	Micrometer
nm	Nanometer