

Development of low frictional coating materials using ionic liquids

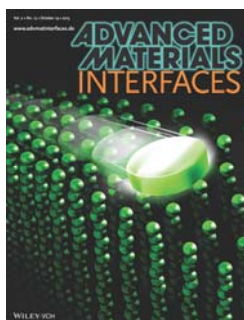


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Technical Support Skills	<ul style="list-style-type: none"> • Surface modification, surface analysis • Friction/ Wear test 		

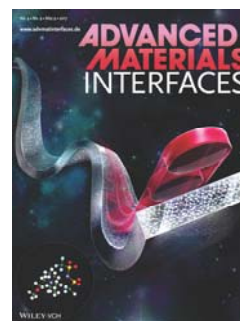
Research Contents Development of low frictional coating materials using ionic liquids

Our research topic is to develop low frictional coating materials using ionic liquids. Ionic liquids (ILs) are molten salts whose melting point is lower than 100 °C. Most popular salts, NaCl, used as table salts in our life do not melt until 801°C owing to strong interaction between composing Na⁺ and Cl⁻. In contrast, ionic liquids can act as liquids even under room temperature by designing structure and combination of composing ions.

ILs possess high thermal stability, negligible volatility and non-flammability. Some part of ILs can keep their liquid state in the South pole or outer space. Thus, ILs are expected as novel lubricants which can provide long life time and high efficiency for mechanical systems under extreme condition. We are now combining ILs and structural polymers to develop low frictional coating materials for mechanical instruments and characterize their lubrication behavior



Smooth film + ILs + polymer brushes
 Coefficient of friction $\leq 10^{-3}$
 under 430 MPa (Hertzian pressure)



ILs + polymer gels
 Maintain lubricated surface under
 70°C or 2×10^{-4} Pa

Available Facilities and Equipment

Laser cutter (Hajime, Oh-laser)	