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A review on ionic liquids as sustainable lubricants in manufacturing and engineering: Recent research, performance, and applications

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ABSTRACT

Many factors tend to influence the increased demand in recent years, including state-of-the-art of effective and environmentally benign lubricants. More importantly, managing volatile demand specifically in the development of lubricant efficiently can be a huge significant to the rapid technological improvements in various engineering and manufacturing industries. To date, tailor-made ionic liquids (IL) investigated for application as lubricants has known to play an important role in enhancing tribological interactions between sliding materials. Present interest concerns recent applications and emerging fields for the utilization of IL as new advanced lubricants. The rheological properties of IL, including their physical and chemical characteristics have shown to be better than conventional lubricants. In regard to applications, we address versatile advances in IL as neat lubricants or additives on different sliding pairs. Following on from this, recent technical developments, industrial applications, biodegradability issues, environmental hazards and future prospects as an excellence potential replacement to the conventional lubricants are outlined.