

Managing solid waste using chloride-based ionic liquids

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ABSTRACT

Total waste generated in peninsular Malaysia was 23,000 tonnes daily in 2010 and 25,000 tonnes/day in 2012. In 2020, the expected waste to be produced has been assessing to achieve 30,000tonnes/day. The increment of waste in Malaysia will reduce the landfill capacity. Combustion is the common option to dispose all the waste, but it will release gas like carbon monoxide and carbon dioxide that harm to human and environment. Thus, the alternative approach is to use low-cost ionic liquids (ILs) particularly in dissolving solid waste. Chloride-based ILs have been introduced for this study basically derives from pyridinium and imidazolium. Solid waste sample being dissolved in three different samples to ILs ratios, which are 1:1.5, 1:3 and 1:5 in mass basis. Different particle between 1.0 and 0.5 mm was also been investigated. The best ILs in dissolving solid waste found to be 1-methylimidazolium chloride ([MIM][Cl]). [MIM][Cl] able to dissolve 6.44% of solid waste at room temperature and 11.79% of solid waste at 40°C with 1:5 mass ratio of 0.5 mm in particle size.

KEYWORDS

Solid waste, Ionic liquids, n-pyridinium chloride, 1-methylimidazolim chloride

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