

Preparation of Imidazolium Group-containing Silsesquioxane Indicating Ionic Liquid Nature

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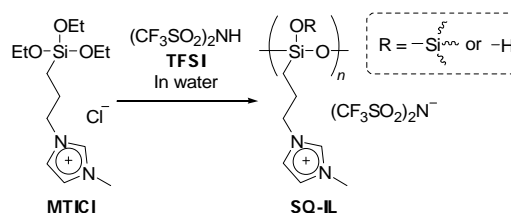
Abstract

Ionic liquids have been widely studied for their remarkable potential. However, little has been reported regarding the preparation of ionic liquids containing inorganic frameworks¹. Recently, we successfully prepared a silsesquioxane (SQ) indicating ionic liquid nature by sol-gel reaction of quaternary ammonium group-containing organotrialkoxysilane using aqueous bis(trifluoromethanesulfonyl)imide (TFSI)².

In this study, a new SQ ionic liquid (SQ-IL) was prepared by the sol-gel reaction of imidazolium group-containing organotrialkoxysilane monomer (MTICl) in aqueous TFSI. The DSC thermogram of SQ-IL exhibited the endotherm peak at -25 °C due to T_g and SQ-IL showed fluidity under 0 °C, *i.e.* room temperature ionic liquid. We also investigated the correlation between the structure of silsesquioxane and ionic liquid nature.

References

- 1) K. Tanaka, F. Ishiguro, and Y. Chujo, *J. Am. Chem. Soc.*, 2010, 132, 17649.
- 2) T. Ishii, T. Mizumo, and Y. Kaneko, *Bull. Chem. Soc. Jpn.*, 2014, 87, 155.



Scheme 1. Preparation of SQ-IL by hydrolytic condensation (sol-gel reaction) of MTICl using TFSI aq.