

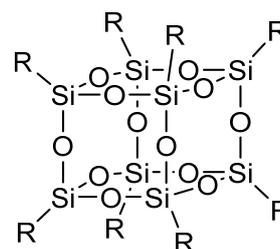
## Synthesis and Properties of Luminescent Materials Using Ionic Liquids Based on POSS

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**Keywords:** POSS; ionic liquid; luminescence;  $\pi$ -conjugated polymer

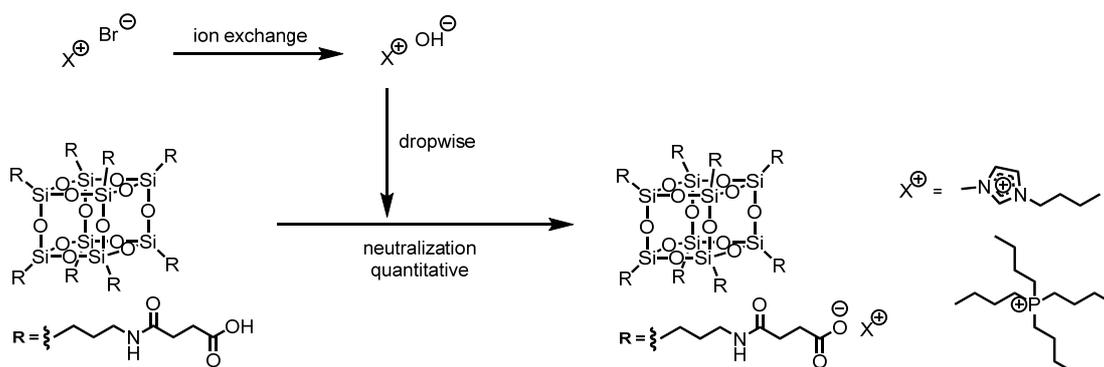
Polyhedral oligomeric silsesquioxane (POSS) has a siliceous cubic structure with 8 organic functional groups (Figure 1). POSS has attracted greater interest as an organic-inorganic hybrid molecule because its derivatives show high thermal stability and it can be introduced organic functional groups easily. We synthesized the first example of the POSS ionic liquid (POSS-ILs).<sup>1)</sup> It was a salt of a carboxylic acid and an imidazolium cation introduced at 8 vertexes of POSS



**Figure 1.** Structure of POSS.

(Scheme 1). The crystallinity was reduced because of the effect of POSS, and even though the molecular weight was high with an octavalent anion, it was found to be the room temperature ionic liquid. Recently, we evaluated the cybotactic environment of POSS-ILs and also revealed that POSS-ILs possessed low normalized polarity compared with the model compounds. Low-polarity ILs are very important for applications such as light-emitting electrochemical cells, because ILs that have a low polar environment as a solvent can dissolve low-polarity organic molecules and macromolecules.

In this research, by dissolving luminescent molecules in POSS-ILs, we compared the optical properties with general organic solvents. We will explain the synthesis and optical properties of ILs and molecules in the presentation.



**Scheme 1.** Synthesis of POSS-ILs.

1) Tanaka, K.; Ishiguro, F.; Chujo, Y. *J. Am. Chem. Soc.* **2010**, *132*, 17649-17651.