**Literature Object: Ionic Liquids**

***During the class meeting***

Please look over the following paper, and answer the guiding questions below. A PDF of this paper may be found on the course Moodle page. You will be working in groups to answer these questions.

***NOTE*** - It is not necessary for you to read and understand every word/concept discussed in this paper. Use the guiding questions to help you focus on relevant information for our purposes.

Kuroda, K.; Miyamura, K.; Satria, H.; Takada, K.; Ninomiya, K.; Takahashi, K. “Hydrolysis of Cellulose Using an Acidic and Hydrophobic Ionic Liquid and Subsequent Separation of Glucose Aqueous Solution from the Ionic Liquid and 5-(Hydroxymethyl)furfural” *ACS Sustainable Chem. Eng.* **2016**, *4*, 3352-3356. [ DOI: [10.1021/acssuschemeng.6b00420](http://dx.doi.org/10.1021/acssuschemeng.6b00420) ]

In this paper, the authors report the preparation of glucose from cellulosic biomass (effectively cornstalks to sugars) using an ionic liquid system.

1. Why would anyone want to make sugar from “cellulosic biomass”?
2. What advantages do the authors list for this system? What other systems/ approaches are used to generate sugars in this manner?
3. Provide a Lewis representation of the ionic liquid reported here as [P8,8,8,5][HSO4]. What structural features make this ionic compound hydrophobic?
4. The authors did not provide a chemical equation for the reactions described here.

a) Write a chemical equation that shows the preparative route to [P8,8,8,5][HSO4], using standard synthetic (i.e. oChem style) notation and formatting. (NOTE - this is not a request for a mechanism)

b) Write a chemical equation that shows the hydrolysis reaction, noting reagents, solvents, temperatures, and times where necessary.

5. The authors comment on the recyclability of this ionic liquid. What evidence do they provide that the [P8,8,8,5][HSO4] remains intact and functional as an ionic liquid? Do they express any concerns?

***Before the next class meeting***

Complete the questions above if you have not done so in your group. For questions that request a chemical equation, create these as a group using ChemDraw or similar software. Submit your responses as a group in a single document (.pdf).