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How Do Ion Specific Effects Operate in Ionic Liquids?

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Recent work has found that the identity of a surfactant's counter-ion can affect the critical micelle concentration, and the size and shape of resultant micelles in ionic liquid (IL) and choline-based deep eutectic solvents.[1,2] This indicates the presence of ion specific effects for micellisation in these neoteric solvents despite their high ionic strength.[3] This project examines this phenomenon further, by investigating a range of choline salts (chloride, bromide, and nitrate) in different nitrate-based ILs (ethylammonium, propylammonium, and ethanolammonium nitrate) via measurements taken on the Small Angle Neutron Diffractometer for Amorphous and Liquid Samples (SANDALS) beamline at ISIS. These results bring new insight into how ion specific effects can exist in high ionic strength neoteric solvents, and the parameters involved in controlling this surprising phenomenon.

- (1) Dolan, A.; Atkin, R.; G. Warr, G. The Origin of Surfactant Amphiphilicity and Self-Assembly in Protic Ionic Liquids. *Chemical Science* 2015, 6 (11), 6189–6198. <https://doi.org/10.1039/C5SC01202C>.
- (2) Sanchez-Fernandez, A.; S. Hammond, O.; J. Edler, K.; Arnold, T.; Douth, J.; M. Dalglish, R.; Li, P.; Ma, K.; J. Jackson, A. Counterion Binding Alters Surfactant Self-Assembly in Deep Eutectic Solvents. *Physical Chemistry Chemical Physics* 2018, 20 (20), 13952–13961. <https://doi.org/10.1039/C8CP01008K>.
- (3) Warr, G. G.; Atkin, R. Solvophobicity and Amphiphilic Self-Assembly in Neoteric and Nanostructured Solvents. *Current Opinion in Colloid & Interface Science* 2020, 45, 83–96. <https://doi.org/10.1016/j.cocis.2019.12.009>.

Presenter Gender

Man

Do you wish to take part in the Student Poster Slam

No

Condition of submission

Yes

Students Only - Are you interested in AINSE student funding

No

Level of Expertise

Early Career <5 Years

Pronouns

He/Him

Which facility did you use for your research

None of the above

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