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SAXS Investigation of Solvent Effect on Globular Proteins

Ionic liquids (ILs) are liquids that are comprised entirely of ions. IL solutions have been widely studied for biochemical applications in recent decades, where their ions interact with proteins and can profoundly regulate their properties and functionalities. However, it is challenging to gain an in-depth understanding on the solvent effect on proteins and specific ion-protein interactions at the molecular level.

Here, we employ small angle X-ray scattering (SAXS) to investigate the effect of a range of IL systems on various globular proteins including lysozyme, green fluorescent protein, α -lactoglobulin, myoglobin and trypsin. The protein functionalities such as size, shape, conformational changes, compactness and aggregation are discussed. The results show that acetate anion can retain the protein folding rather than mesylate anion. In addition, we use size exclusion chromatography (SEC)-SAXS to explore the aggregation and the conformations of the different proteins. We further employ modelling tools including CRY SOL, GASBOR and SREFLEX to reconstruct and model protein structure and understand the solvent effect on proteins at an atomic level. This study can improve our understanding of protein misfolding and aggregation and pave the way to design solvents to control the protein behaviours.

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

Level of Expertise

Early Career <5 Years

Pronouns

Which facility did you use for your research

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