

Propositions

accompanying the dissertation

Molten Salt Reactor Chemistry:
Structure and Equilibria

By

Jaén A. Ocádiz Flores

1. “In spite of the ...total inadequacy of a Gaussian shell model for describing atomic distributions in liquids,”¹ standard fitting with the EXAFS equation yields meaningful information of the coordination environment around actinide cations in molten salts (this thesis).
2. In alkali actinide fluorides, longer fluoride-actinide bond distances become thermally available upon melting, yet the average distance decreases or stays the same due to a lower coordination number caused by decreased fluoride-fluoride repulsion (this thesis).
3. Databases to compute the state functions of molten salts for nuclear applications, e.g. density and viscosity, can be correlated to and assessed from existing thermodynamic databases via the quasi-chemical formalism (this thesis).
4. Even though accurate results can be obtained, using the Nernst-Einstein equation is not recommended to calculate the electrical conductivity of fused salts, as it is not a physically realistic starting point.
5. Beyond nuclear power, the most important and exciting breakthroughs in actinide chemistry will be in highly versatile, multi-functionalized metal-organic frameworks (MOFs).
6. Oil companies are uniquely suited to diversify into the nuclear sector.
7. A strong background on numerical methods should be an integral part of the undergraduate chemistry curriculum.
8. On a scale to generate the baseload electricity of civilization, fission is preferable to fusion via the D-T reaction.
9. Even if one can afford it, buying a house is not always an optimal financial decision compared to renting.
10. A treadmill desk is a singular work environment to boost productivity and creativity.

These propositions are regarded as opposable and defensible, and have been approved as such by the promoters Prof. dr. R.J.M. Konings and Dr. A.L. Smith.

¹ Adriano Filipponi 2001 *J. Phys.: Condens. Matter* **13** R23

