

## Can “structure” tune absorption spectra in rare-earth-ion solids?

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The optical properties of a RE-ion solid depend strongly on the crystal field experienced by the RE-ions in their local structural environment. The notion emerges that the optical spectra from such materials could perhaps be tuned by modifying the local host structure in some systematic manner.

In the course of our work, we have endeavoured to probe this possibility for the case of Er<sup>3+</sup> ions in a polymer (PEO) host; see Refs.[1]-[3]. The spectral contributions calculated (using an extended Judd/Ofelt theory) for each RE-ion in each local environment (generated by MD simulation) are accumulated to provide a “theoretical absorption spectrum”.

Inspection of the resulting spectra compared to their experimental counterparts has provided us with some insights into the extent to which we can, in fact, tune a RE absorption spectrum by varying the structure of its environment. Our general conclusions will be presented.

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### *References:*

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