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## Cation distribution in spinel phase nanocrystals

### Abstract

The spinel oxide structure, usually formulated as  $MM'_2O_4$ , has the property of accommodating its different cations in crystallographic sites with different oxygen coordination, usually  $M^{2+}$  in sites with tetrahedral oxygen coordination (A-sites) and  $M'^{3+}$  in octahedral coordination (B-sites). Because of their significant influence on magnetic response and catalytic activity, a precise knowledge of cation distribution and inversion parameter in core-shell spinel based systems is essential to understand and synthesize nanoparticles with the desired properties.

In this presentation how to take advantage of STEM - EELS techniques to determine cation distribution and oxidation state in core/shell nanoparticles at atomic resolution will be discussed, as well as the usage of state of the art statistical methods in order to determine the oxidation state of individual atomic columns in a HR-TEM experiment.