



## **Tetraalkylammonium manganese oxide gels: Preparation, structure, and ion-exchange properties**

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### **Abstract:**

The structure and ion-exchange properties of tetraalkylammonium (TAA; alkyl = methyl, ethyl, propyl) manganese oxide gels produced from colloidal manganese oxide solutions are presented. TAA manganese oxide xerogels are analyzed by X-ray powder diffraction (XRD) and extended X-ray absorption fine spectra (EXAFS) and can be modeled on an octahedral layered, pseudo-hexagonal structure. Ion-exchange reactions are performed with  $\text{Na}^+$ ,  $\text{Mg}_2^+$ ,  $\text{Ni}_2^+$ ,  $\text{Cu}_2^+$ , or  $\text{La}_3^+$  with wet gels and the factors that influence the resulting structure and uptake are described. Exchange of xerogels was accomplished only in the presence of base. Despite variations in the sorption of different ions, the TAA cations are completely and rapidly removed from the structure.