Characterisation and processing of aqueous LaNi$_{0.6}$Fe$_{0.4}$O$_3$ Suspensions into Porous Electrode Layers for Alkaline Water Electrolysis

The colloidal properties and processing of aqueous LaNi$_{0.6}$Fe$_{0.4}$O$_3$ suspensions into electrode layers with hierarchical pore sizes has been investigated by light scattering, electron microscopy and rheology. We found that the colloidal stability of the oxide particles and the resulting microstructure of the electrode layers were similar when dispersing the particles at their intrinsic pH, or when adding polyvinylpyrrolidone. The addition of the ammonium salt of poly(methaacrylic acid) resulted in a poor colloidal stability and the concentrated suspensions became viscoelastic during processing. Addition of rice starch resulted in an increase of the porosity but the cast electrode layers cracked and delaminated.

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