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The Specific Co-Ion Effect on Gelling and Surface Charging of Silica Nanoparticles: Speculation or Reality?

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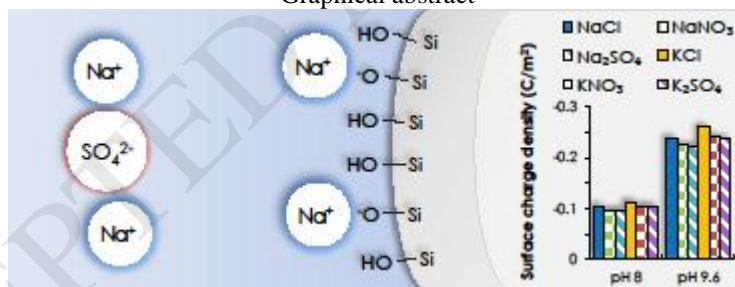
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Graphical abstract



Abstract

Based on extensive experimental investigations on many different oxide nanoparticles, it is now a well-established view that the counter-ions exhibit ion specific effects due to their high charge density and strong interaction with oppositely charged surfaces. On the other hand, studies regarding co-ion effects are scarcely reported in the literature. In this study we have measured the surface charge densities and gel-times of silica nanoparticles in a number of salts which have the same counter-ions but different co-ions, i.e. anions in this case. Gel-times were measured in LiCl, NaCl, NaNO₃, NaClO₄, NaClO₃ and Na₂SO₄ as well as in KCl, KNO₃, and K₂SO₄. We have seen clear correlations between the gel-times and the extent of ion-pairing in the solutions; salts that have

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