

# **Fragile to strong crossover coupled to liquid-liquid transition in aqueous solutions**

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## **ABSTRACT**

In the last few years compelling evidences from simulations have indicated that in bulk water the fragile-to-strong dynamic transition in the diffusive behavior is coupled to the low-density/high-density liquid-liquid transition. In this picture, above the liquid-liquid critical pressure, the diffusivity crossover occurs in temperature at the Widom line, the line along which the thermodynamic response functions show maxima. Below the liquid-liquid critical pressure, the diffusivity crossover must occur when the temperatures of the limit of mechanical stability lines are crossed.

Using molecular dynamics simulations I will show how this picture transfers from bulk to solutions. I will in particular show the behavior of relaxation times and diffusion coefficients for water in solutions with NaCl and with hydrophobic solutes in a wide range of temperatures and pressures upon supercooling.

The emerging dynamical picture will be superposed to the phase diagrams and framed in the thermodynamic scenario. These results show that the study of the dynamics, and in particular of the fragile to strong transition, of supercooled water in solutions represent a viable route for experimentalists to solve the open question of the existence of the liquid-liquid critical point.