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Reply to "Comment on 'Low-frequency Raman-scattering study of the liquid-glass transition in aqueous lithium chloride solutions'"

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On the basis of the preceding Comment [Phys. Rev. E **49**, 2493 (1993)], our conclusion concerning the O—O—O bending mode assignment is withdrawn. However, our major conclusions concerning the Martin-Brenig theory and the mode-coupling theory as possible explanations for the light-scattering spectrum of supercooled LiCl solutions are not affected.

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In our light-scattering experiments on aqueous lithium chloride solutions [1], we studied the intensity and polarization of the Raman spectral feature near 60 cm^{-1} in the supercooled liquid and glass phases. This feature, frequently designated as the "boson peak," appears in the Raman spectra of all amorphous solids somewhere between ~ 20 and 80 cm^{-1}. Our major objective was to critically test the widely employed Martin-Brenig model which attributes the boson peak to disorder-induced scattering from acoustic phonons. We found that the Martin-Brenig model was clearly inadequate, particularly with regard to polarization properties. We also investigated a model based on Stephen's dipole-induced–dipole light-scattering mechanism combined with the mode-coupling theory of supercooled liquid dynamics, and found that the predictions of this theory are in much better agreement with the experimental data in the glass phase, and also provides a natural description of the evolution of the low-frequency Raman spectrum from the liquid to the glass.

We also briefly mentioned several other previously proposed explanations for the 60-cm^{-1} Raman feature in H_2O. We suggested that the assignment of this feature to an O—O—O bending mode was unlikely since the feature persists at high lithium chloride concentrations where water molecules are bound in LiCl hydration shells so that O—O—O bridges should be very rare.

In their Comment [2], Walrafen *et al.* point out that the bending mode of O—O—Cl is nearly degenerate with that of O—O—O, so that the absence of observable intensity change with increasing lithium chloride concentration cannot be used to invalidate the assignment of the 60-cm^{-1} feature to O—O—O bending. We appreciate their pointing this out, and we, therefore, withdraw our statement concerning this assignment. However, this point has no effect on the major conclusions of our paper.

We also emphasize that there continues to be considerable controversy surrounding the origin of the boson peak, with some evidence suggesting that quasilocalized vibrational modes may play an important role [3]. It is not yet clear if one should view the boson peak as essentially phononlike or diffusive, or as some linear combination of the two. New experimental investigations and computer simulation studies being pursued in a number of laboratories will hopefully provide a complete understanding of this ubiquitous but still somewhat mysterious feature.

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