Supplementary Information for

Rotational Dynamics of Thiocyanate Ions in Highly Concentrated Aqueous Solutions

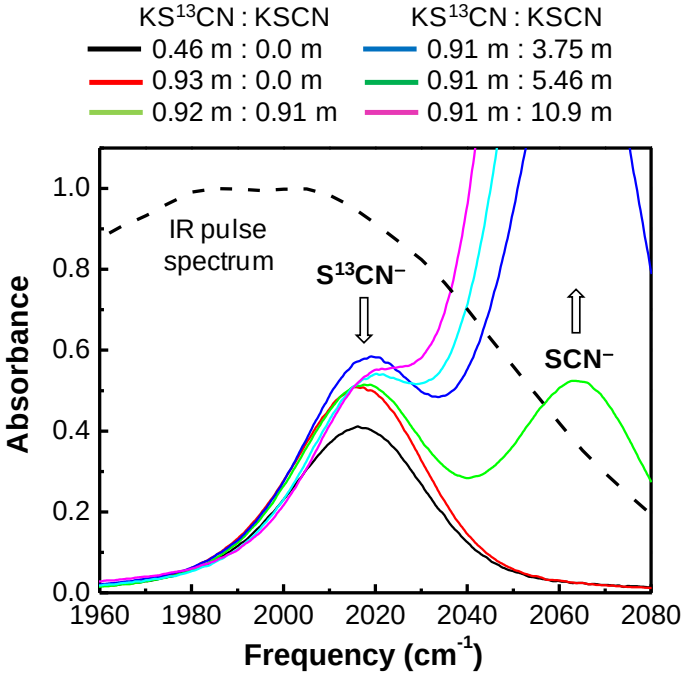
Heejae Kim,[1] Sungnam Park,[1,2*] and Minhaeng Cho[1,2,*]

[1]*Department of Chemistry, Korea University, Seoul 136-701, Korea.*

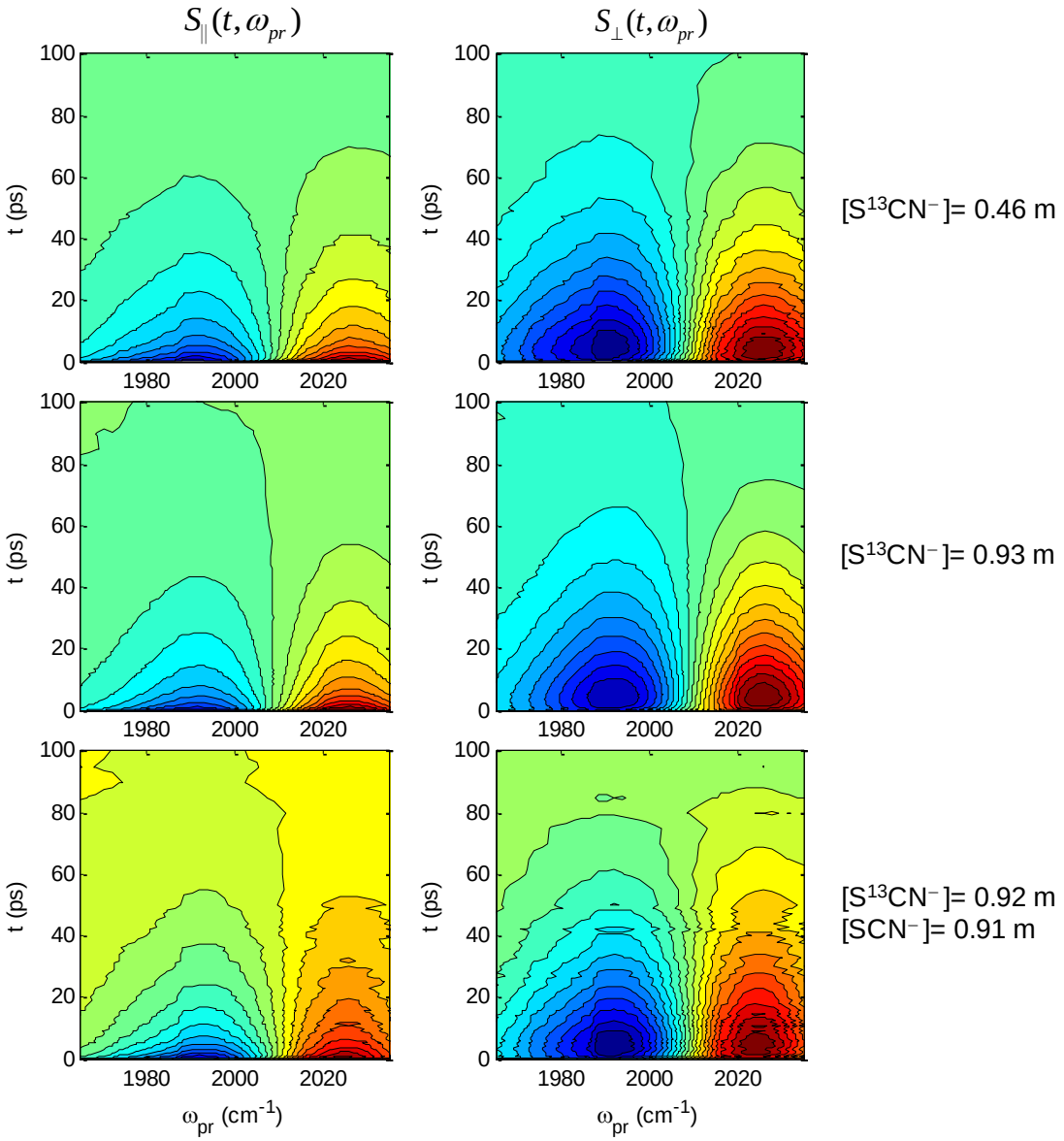
[2]*Multidimensional Spectroscopy Laboratory, Korea Basic Science Institute, Seoul 136-713, Korea.*

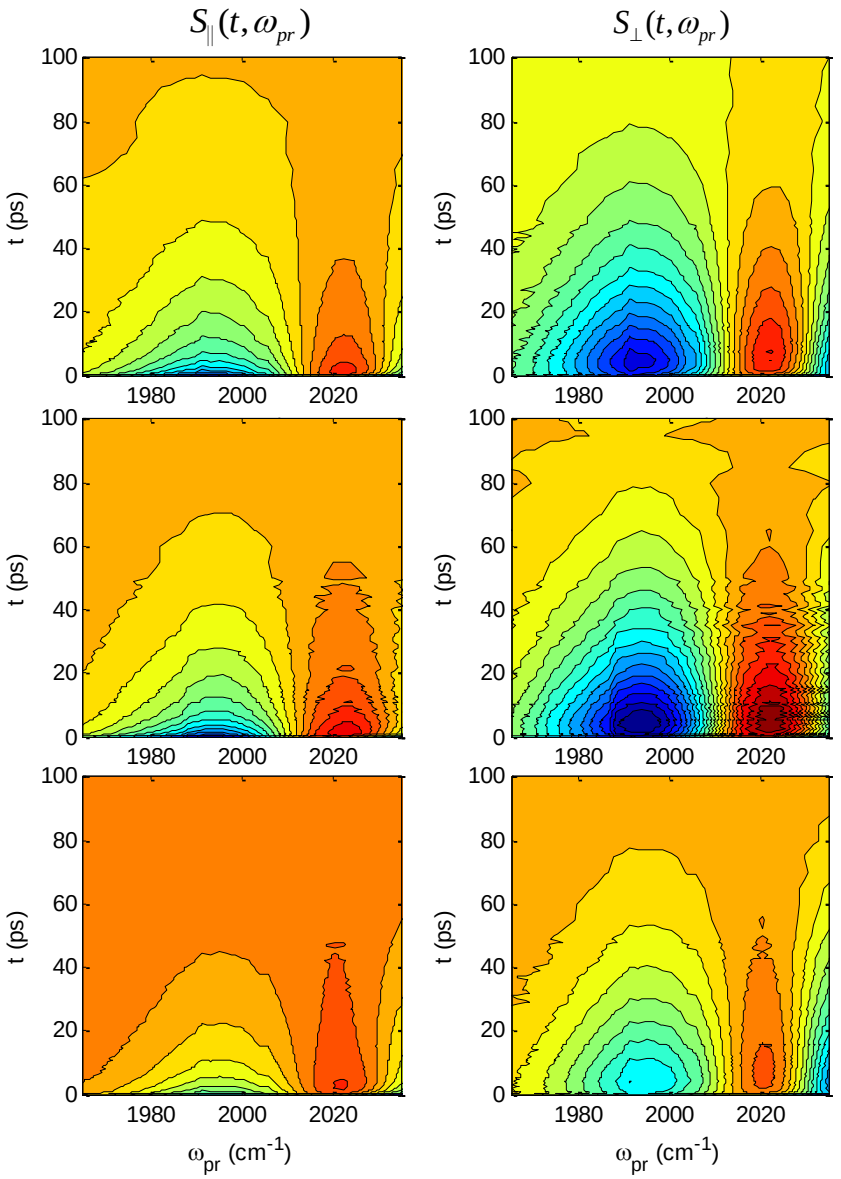
In this Online Supplementary Information, we present the original FTIR spectra of the sample solutions, all the measured dispersive IR pump-probe signals, calculated hydrodynamic radius of $S^{13}CN^-$ ion at different potassium thiocyanate concentrations, and previously reported viscosities of KSCN in H_2O solutions.

Figure S1. The background-corrected FTIR spectra of sample solutions without intensity normalization. Figure 2 in the main text is obtained by normalizing the absorbance of the $S^{13}CN^-$ band.



Figture S2. Dispersive IR pump-probe signals measured at different KSCN concentrations.

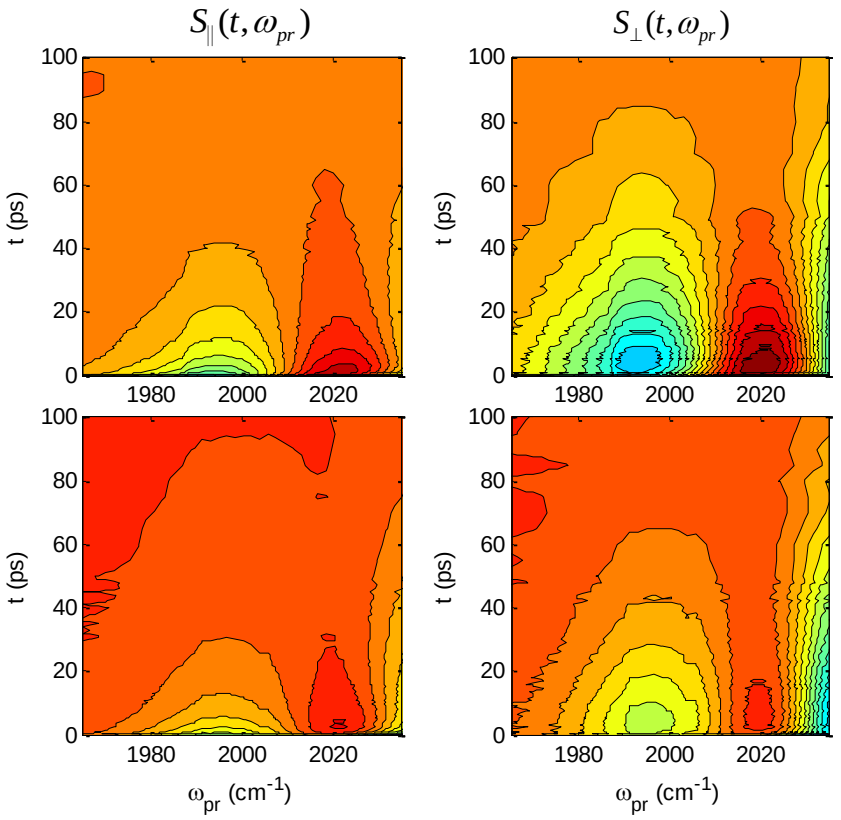




[S^{13}CN^{-}]= 0.94 m
[SCN^{-}]= 2.83 m

[S^{13}CN^{-}]= 0.92 m
[SCN^{-}]= 3.75 m

[S^{13}CN^{-}]= 0.91 m
[SCN^{-}]= 5.46 m



[S^{13}CN^{-}]= 0.90 m
[SCN^{-}]= 8.23 m

[S^{13}CN^{-}]= 0.91 m
[SCN^{-}]= 10.9 m

Figure S3. Hydrodynamic radius (R_{hyd}) of $S^{13}CN^-$ ion is calculated by using the DSE (Debye-Stokes-Einstein) equation with the rotational relaxation times obtained from the IR pump-probe signals measured at ω^*_{pr} = 1982 cm^{-1} at different potassium thiocyanate concentrations. The hydrodynamic radius of $S^{13}CN^-$ ion appears to be independent of the concentration of potassium thiocyanate in D_2O. For the calculation of R_{hyd}, the viscosity of KSCN in H_2O reported in *J. Solution Chem.*, **21**, 1115-1129 (1992) is used.

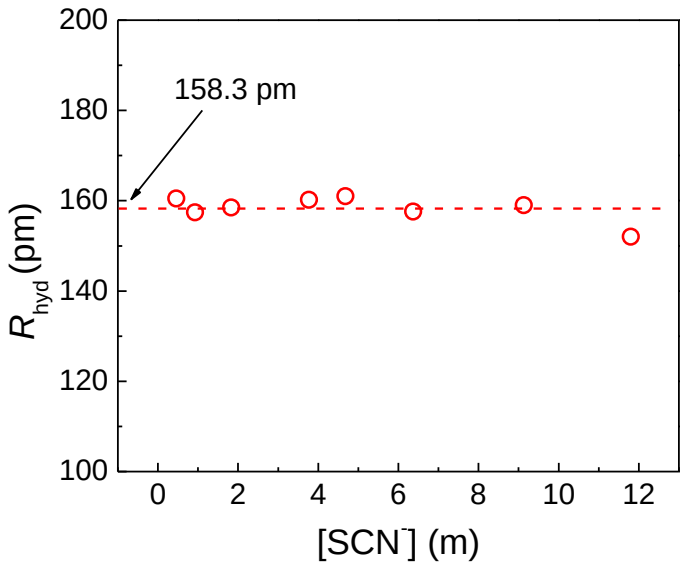


Figure S4. Viscosity of KSCN in H_2O as a function of the KSCN concentration. The following graph is reconstructed by using the experimental results reported in *J. Solution Chem.*, **21**, 1115-1129 (1992).