Chemical homogeneity and network topology from NMR experiments.

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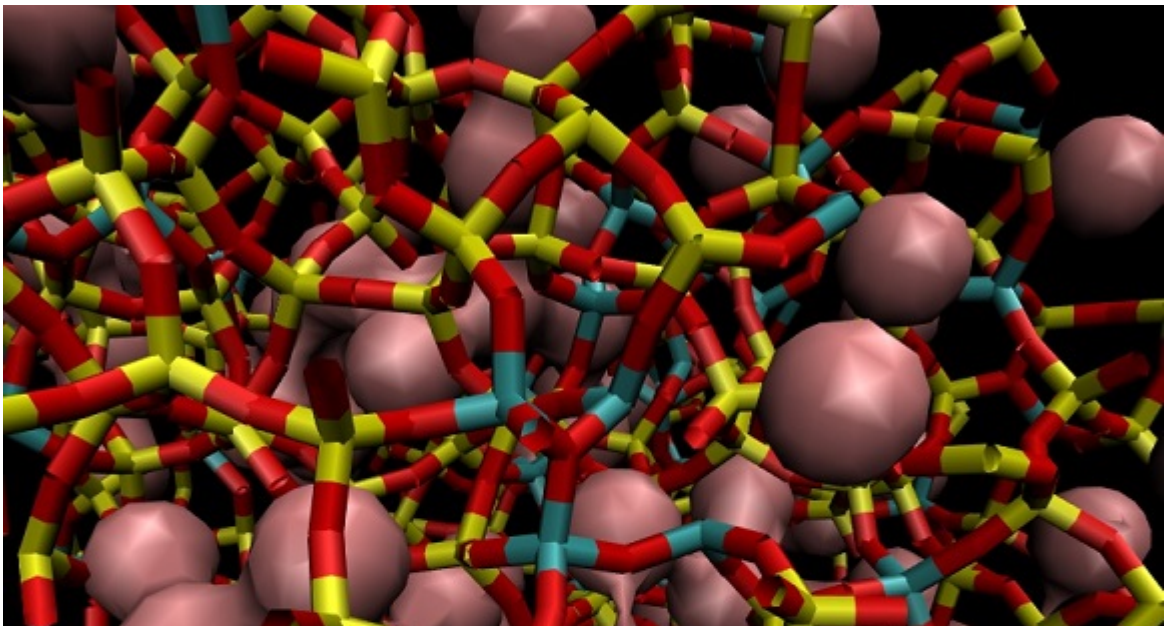
The structure of glasses at the nanometer scale can be assed from homo- of hetero-nuclear NMR experiments involving ensembles of NMR active nuclei [^{11}B, ^{17}O, ^{23}Na, ^{27}Al, ^{29}Si, ^{31}P…]. They provide different types of information on the spatial proximities or on the nature of the network of chemical bonds. They thus allow to characterize the structure, chemical homogeneity, or topology of ordered or disordered solid state materials at the molecular level that are closely related to their macroscopic properties.

The challenge is both to measure isotropic and/or anisotropic interactions under high resolution conditions, to use them efficiently to establish multidimensional correlation experiments and to draw a comprehensive picture together with DFT based computations. In solid state inorganic materials the difficulty comes with the variety of possible situations involving spin 1/2 and quadrupolar nuclei which remain challenging to measure, especially in the seldom explored case of homo- or hetero-nuclear pairs of quadrupolar spins.



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