Rigidity transition : a new approach of the mechanical properties in silicate glasses

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The constraints theory (Phillips) has been largely used to describe the structure and the mechanical properties of covalent glasses. This point of view has been particularly illustrated by the example of chalcogenides glasses. A rigidity transition has been predicted and found between with rigid or floppy phases. Recently, the existence of an intermediate isostatic phase has been demonstrated in the chalcogenide glasses (Boolchand). We study silicate glasses in the frame of the same approach. Our results obtained by Brillouin scattering show that the mechanical properties of these glasses can be interpreted using the same concept of rigidity transition.