THE INFLUENCE OF WATER ON THE PHYSICAL PROPERTIES OF MAGMAS

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Dissolved water exerts a strong influence on the physical properties of magmas, but little was known about how this influence varies with temperature and silicate composition. Thanks to the slowness of water exsolution, however, it is possible to make accurate measurements in the supercooled liquid state just above the glass transition. Viscosities, heat capacities and thermal expansion coefficients measured in this way for a series of melts with up to 5 wt% H2O will be presented. These results show that the effects of water strongly depend on silicate structure and composition. Their important implications for magmatology and water dissolution mechanims will be discussed.