The influence of aging conditions on the textural properties of water-glass-based silica aerogels prepared at ambient pressure

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In the present study, the experimental results of aging time and temperature on the textural properties of water-glass(sodium silicate)-based silica aerogels are reported and discussed. Aging of the hydrogel for different times and temperatures led to an ability to increase the stiffness and strength of the networks. These improvements enabled the gel to withstand ambient pressure drying(APD) and, consequently, preserve the highly porous silica network without collapse. Monolithic aerogels with extremely low bulk density(~0.069 g/cm^3), high specific surface area(820m^{2}g^{-1}), large cumulative pore volume (3.8cm^{3}g^{-1}) and high porosity (~96%) were obtained by aging at 60oC for 18hours.