
A Comparative Study of Thermal Effects on Surface and Structural Parameters of Natural Californian and Quebec Chrysotile Asbestos up to 700° C

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Abstract: The effect of heat treatment on surface area, pore volume, pore size distribution, physical and chemical structure up to 700° C have been studied on samples of naturally occurring chrysotile minerals from California and Quebec. Techniques used included thermogravimetric analysis, low-temperature nitrogen adsorption, electron microscopy, X-ray powder and electron diffraction. The materials behaved similarly on heating to 100° C showing a 0.5% weight loss attributable to desorption of physisorbed water. At 500° C Quebec samples retained the chrysotile crystal structure while Californian samples were X-ray amorphous. Forsterite was formed by dehydration of both chrysotiles at 700° C; the greater stability of the Quebec samples to this process is explained by the presence of brucite as an impurity which enters into stray solid-solid interactions with the chrysotile.

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