A study of the water vapor sorption isotherms of hardened cement pastes: Possible pore structure changes at low relative humidity and the impact of temperature on isotherms

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Using water vapor sorption isotherms measured by the "dynamic vapor sorption" (DVS) method, a resaturation study was conducted to investigate possible pore structure changes of hardened cement paste samples caused by the drying at low relative humidity during desorption measurements. The results indicate that either the relatively short term drying does not cause any microstructure changes or the pore structure of the hardened cement paste samples can be restored during the absorption process. Additionally, the temperature dependency of sorption isotherms was investigated using both hardened cement paste samples and a model material MCM-41. The pronounced impact of temperature on desorption isotherms of cement based materials as reported in literature was not found in this investigation. The results suggest that the differences between the sorption isotherms measured at different temperatures are mainly caused by the temperature dependent properties of water.

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