Silica Aerogels and Silica Aerogel-Carbon Composites for Adsorption of Micropollutants

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Unmodified silica aerogel and modified silica aerogel, which was combined with two forms of carbon (graphite and activated carbon) to create new materials with theoretical enhanced adsorption power, were prepared to study their adsorption characteristics for drospirenone as exemplary case, a typical micro pollutant present in urban waste waters, which current purification treatment techniques have difficulties in removing. We show that unmodified silica aerogel, graphite-aerogel and activated carbon-aerogel have high adsorption capacities for drospirenone, respectively of 5.6×10-5, 5×10-5 and 6.5×10-5 mg of hormone adsorbed per mg of aerogel, and that it can remove all traces of drospirenone after just two treatments even at concentration levels higher than found in waste water. The aerogel composites were found to be more efficient adsorbents than activated carbon.

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