143d Removal of as(V) by Chemically Modified Granular Activated Carbon

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Chemically treated granular activated carbon (MGAC) significantly enhanced As(V) removal over virgin granular activated carbon (GAC), especially at trace As(V) levels. The removal of As(V) for both MGAC and GAC were quite pH dependent. The optimal pH for As(V) adsorption occurred at 5.0 and 6.0 for MGAC and GAC separately. At initial As(V) concentration 150 ppb, a dosage of 5 g/L MGAC resulted in a residue As less than 10 ppb, compared with 80 ppb by GAC. Kinetics study showed that at initial As(V) 150 ppb, more than 99% As(V) was removed by MGAC within 30 minutes, compared with 120 minutes by GAC. This difference, however, was not apparent at high As(V) concentrations. Langmuir model fitting well with isotherm data, which gave the maximum As(V) binding capacities (qmax) 1.23 and 1.14 mg/g for MGAC and GAC separately. The affinity of As(V) (b) to MGAC (1.86 L mg-1) was much higher than that of GAC (0.88 L mg-1).