Electronic Supplementary Materials (ESM)

Coagulated Mineral Adsorbents for Dye Removal, and their Process Intensification Using an Agitated Tubular Reactor (ATR)

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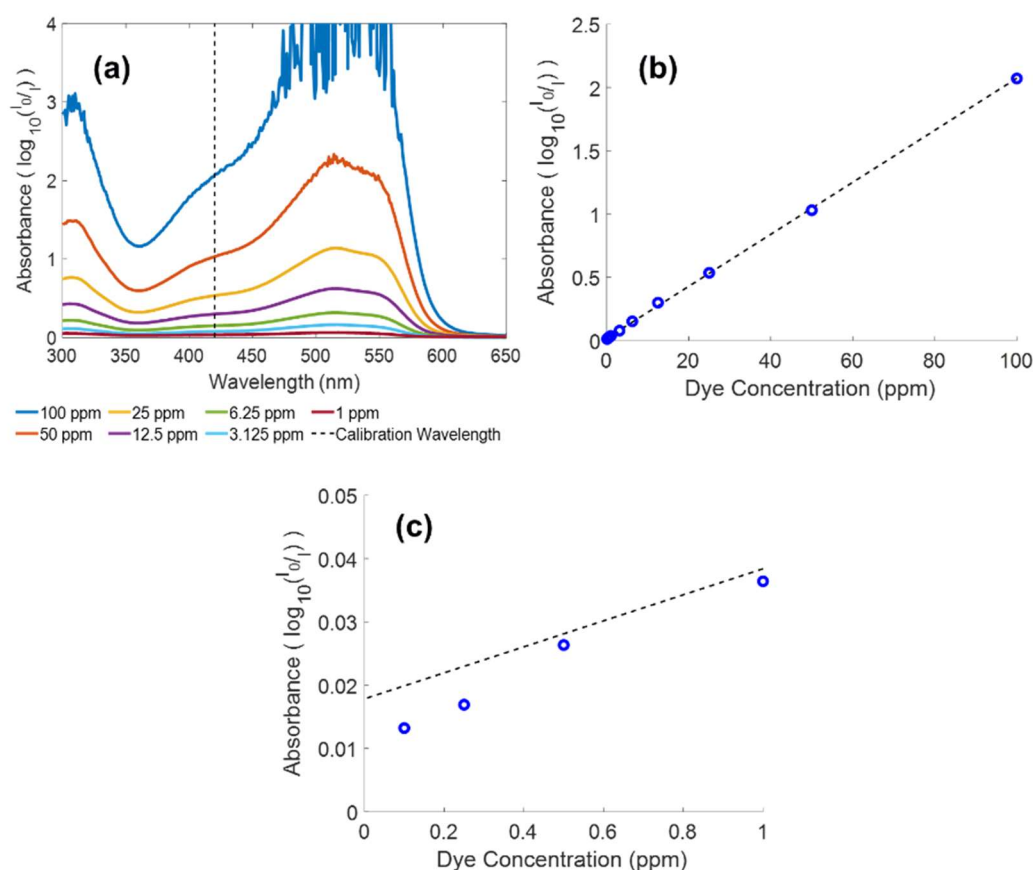
Figure S1: a) UV-Vis spectrum data (200-800 nm) for azo dye at 1-100 ppm, with b) concentration calibration & c) low-concentration region showing the lower limit of detection (0.5 ppm).
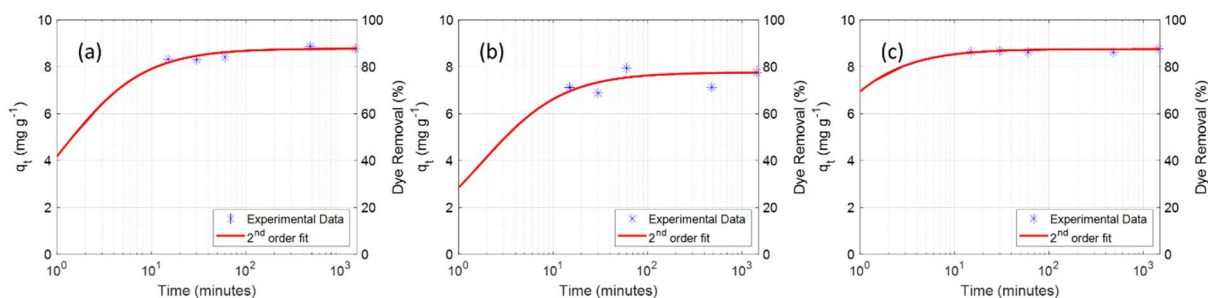
Figure S2: Kinetics of dye uptake with (a) modified bentonite, (b) talc and (c) calcium carbonate using 100 ppm dye solutions over the full measurement period of 1500 min on a logarithmic time scale. Data shown in terms of relative adsorption capacity, q_t (in mg g^{-1}), on left-hand axes, and dye removal percent on right-hand axes.

Table S1: Standard deviation in q_t (mg g^{-1}) for dye uptake kinetic data.

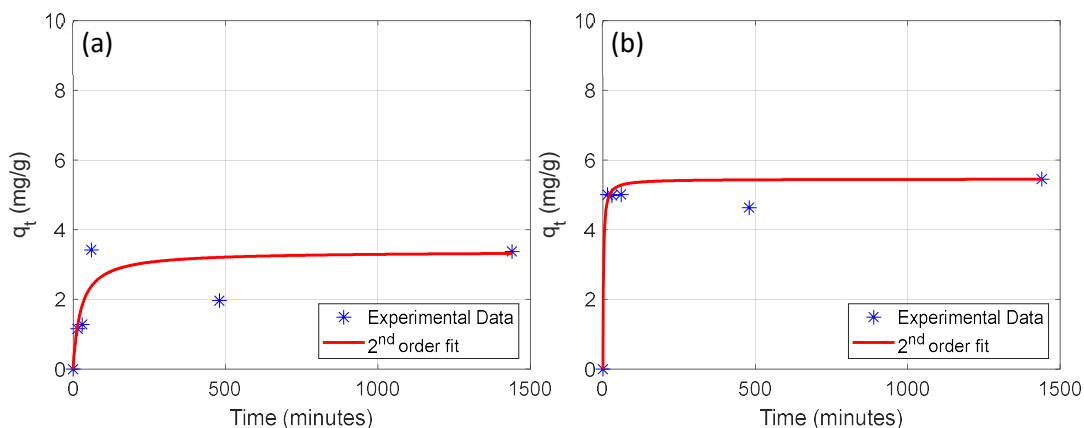|	Time (minutes)				
	15	30	60	480	1440
Bentonite	0.003	0.001	0.014	0.061	0.053
Talc	0.126	0.162	0.040	0.131	0.056
Kaolin	0.339	0.334	0.231	0.312	0.241
Calcium Carbonate	0.039	0.041	0.037	0.036	0.051
Zeolite	0.396	0.406	0.395	0.415	0.334

Figure S3: Kinetic adsorption results for dye uptake with (a) kaolin and (b) zeolite, in terms of adsorption capacity, q_t.
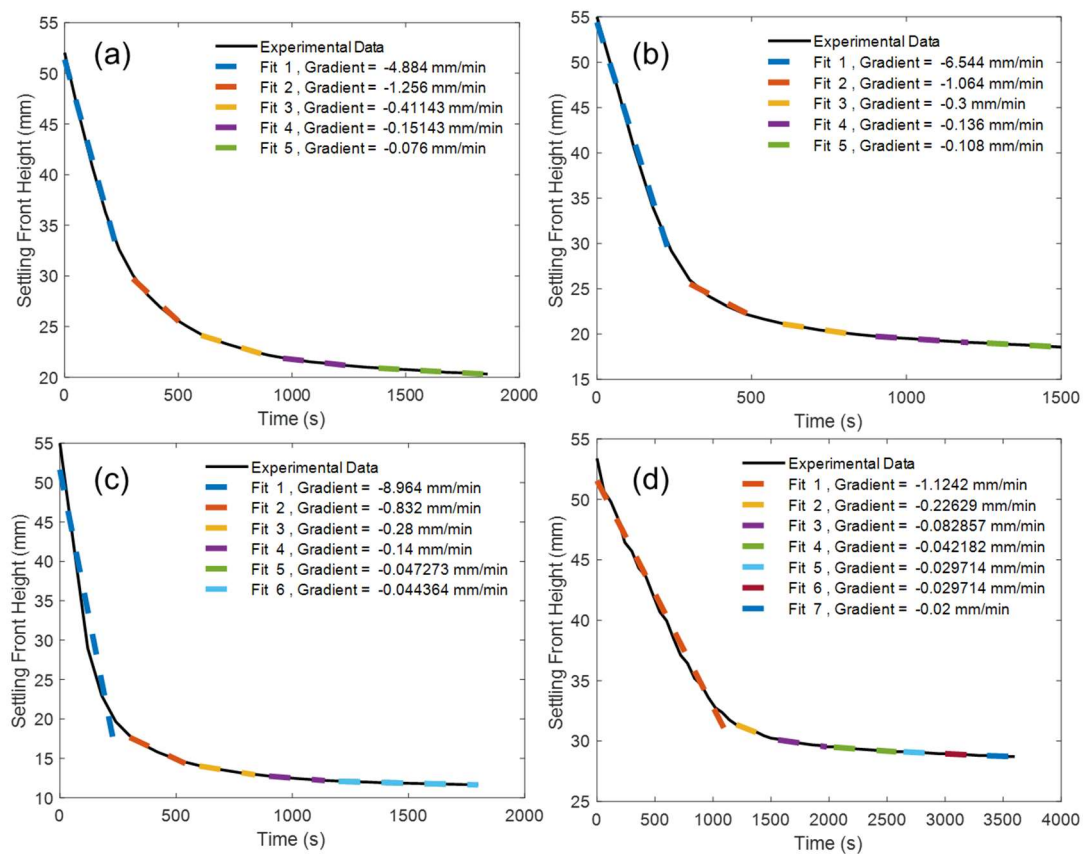
Figure S4: Settling curve data for coagulated adsorbents including multiple zone linear fits; a) modified bentonite, b) talc, c) calcium carbonate. Also shown is d) iron hydroxide floc only.

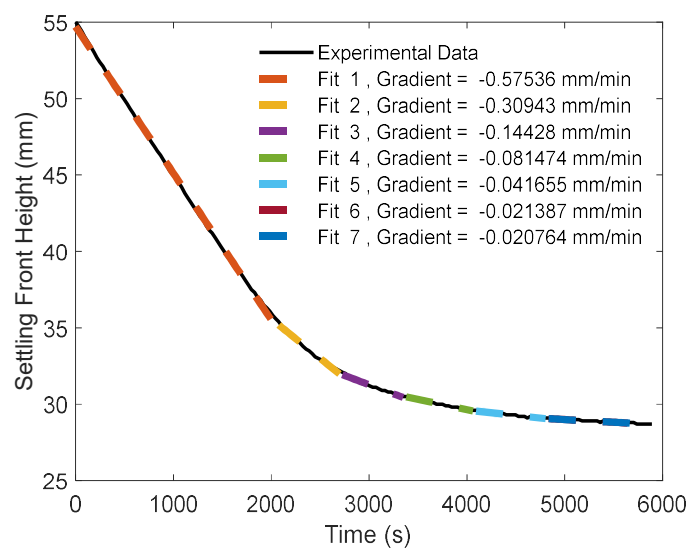**Figure S5: Outlet flow from the agitated tube reactor after 90 min of operation.**

Figure S6: Settling curve for coagualted calcium carbonate samples obtained from the ATR after 90 min of operation (using a 15 min reactor residence time). Includes multizonal linear fits.