This invention:
• Presents fast and easily prepared immobilized amine sorbents that contain polyamines, chemical cross-linkers, and silica that are structurally stable
• Captures a variety of dye and colorant species from flowing aqueous streams
• Is recyclable over multiple cycles
• Shows promise for commercial-scale processes involving colorant removal from flowing aqueous streams or stationary aqueous environments
• Has a low raw material cost, recyclability and is free of sodium and calcium adsorptions indicating that the sorbent will capture pollutant dyes in the presence of accompanying additives from a variety of water sources like textile runoff and drinking water

This innovation can covalently immobilize dye-absorbing amine sites with low cost, porous silica particles. The sorbents have the potential to remove other organic-based colorants and pollutants from different water sources.

This invention:
• Presents fast and easily prepared immobilized amine sorbents that contain polyamines, chemical cross-linkers, and silica that are structurally stable
• Captures a variety of dye and colorant species from flowing aqueous streams
• Is recyclable over multiple cycles
• Shows promise for commercial-scale processes involving colorant removal from flowing aqueous streams or stationary aqueous environments
• Has a low raw material cost, recyclability and is free of sodium and calcium adsorptions indicating that the sorbent will capture pollutant dyes in the presence of accompanying additives from a variety of water sources like textile runoff and drinking water

Anticipated uses of the invention primarily include any flowing or stagnant aqueous system with dye materials including drinking water, ponds, rivers, lakes, seawater, and groundwater. Some key sources for the dye can be from textile waste water streams, food processing waste water streams, and coffee bean waste waters. Alternative uses of the invention includes the adsorption of toxic organic materials that bear structural similarity to the dye molecules.

(continued)
RELATED PATENTS:
U.S. Patent No: 10,836,654
Issued: 11/17/2020
Title: Stable Immobilized Amine Sorbents for Removal of an Organic Contaminant from Wastewater
Inventors: McMahan L. Gray, Brian W. Kail, Quiming Wang, Walter C. Wilfong
NETL Reference No: 17N-18