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Arsenic pollution is a problem for many parts of the world, including portions of WV. Arsenic has been linked to cancer and other serious health problems. Because thiol (-SH) groups have an affinity for heavy metals such as arsenic, it is possible to make a functionalized polystyrene foam to remove arsenic. Polystyrene foams were made using an emulsion technique and functionalized through a series of reactions. First, halogenation was performed, then a thioacetate substitution, after which the foams were deprotected using a strong base solution. 120 mg/cc foams were made using high internal phase emulsion polymerization and analyzed by thermogravimetric analysis and infrared spectroscopy after each functionalization reaction. After the halogenation reaction, the thioacetate substitution reaction was done using three different times (8, 6, and 4 hours) to see if this affected the results. It was seen that all functionalized foams did remove some amount of arsenic, even with varying substitution reaction times.