Title: Isolation of Water from a Heterogeneous Mixture of Sodium Chloride, Copper (II), Iron (III), and Sand

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Creating a heterogeneous solution with known amounts of 0.1 M ferric chloride, 0.1 cupric chloride, sodium chloride, and sand in order to properly separate each component, by using chemistry-based procedures. There have been multiple instances in history where water contamination has made people extremely ill or has even been proven fatal. An instance in history where contaminated water has made people extremely sick started back in 1952 when San Francisco-based Pacific Gas & Electric Co. opened up a natural gas compression station and leaked hexavalent chromium (chromium-6), into the groundwater of Hinkley, California. Chromium-6 is a carcinogenic substance that can be extremely harmful to humans and animals. The chromium-6 that leaked into the groundwater of Hinkley California affected many lives by causing people to get sick which eventually turned the city into a ghost town. As this reveals, keeping heavy metal contaminants out of drinking water is extremely important, which is why this research was conducted. Basic and more advanced chemistry-based procedures, as in distillation, filtration, electrolytic cells, and galvanic cells were utilized to separate the four components. The goal of this project was to properly and effectively isolate heavy metal contaminants (iron and copper), sodium chloride, and sand to make viable drinking water. A combination of these procedures led to percent yields of iron, copper, salt, and sand to be 566.2847%, 1101.8095%, 17.3508%, and 99.3230%, respectively. We hope these procedures can be implemented to help provide clean viable drinking water for people across the globe.

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