Fractionation of organic matter and validation of groundwater treatment technology

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ABSTRACT

Iron and manganese often exceed the acceptable concentrations in groundwater. Conventional technologies for the iron and manganese removal from groundwater (aeration and filtration) are inefficient when the groundwater contains high concentrations of organic matters. Usually organic substances that are in groundwater compose with iron organic complex matters, which are difficult to remove by conventional treatment. Coagulation is the most common method of organic compounds removal. In order to select proper treatment technology, the composition of organic compounds shall be determined in water. For this purpose, we used fractionation of organic compounds. This study analyses the types of organic compounds that are dominating in the particular groundwater, and how polyaluminium chloride affects organic and iron organic complex compounds that are present in groundwater under laboratory and pilot plant conditions. After fractionation of groundwater samples, it has been identified that the major fraction of organic compounds were very hydrophobic acids (69%), and major part of soluble divalent iron form complex compounds with these acids (81%). Results of research shows that concentrations of organic compounds, iron and iron organic complexes, and color of groundwater can be removed using polyaluminium chloride for coagulation process.

Keywords: Coagulation; Filtration; Fractionation; Groundwater; Iron; Organic matter

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