

Project: Analytical Characterization of Choline Chloride in oilfield waters

Abstract

Shale structures with poor porosity and permeability contain a majority of clay which can easily swell and slow the production rate of gas recovery by hydraulic fracturing processes. Therefore, a clay stabilizer is an important additive to prevent this problem. Choline chloride which is replacing many various environmentally-unfriendly clay stabilizers is considered to have fewer potential impacts on human health and the environment. There are concerns about purity of choline chloride products for oil and gas companies. The residual choline chloride in oilfield wastewater on drinking water and its effect on marine life has generated additional concern for many ecologists and environmental regulatory agencies. The current methods involving titration and colorimetry are not sensitive or selective for choline chloride. None of the current methods provides a single test to unequivocally quantify choline chloride, and also adulterants which may be present may not be easily identified. Therefore, the goal is to develop a sensitive, rapid and simple single method by capillary electrophoresis that can be used in the oil and gas industry to quantify choline chloride in their process waters as well as provide an excellent separation from ammonium, potassium and sodium ions which may be present in the oilfield process waters.

Student name: Vi Tran

Supervisor: Dr. Kingsley Donkor

Committee members: Dr. Kingsley Donkor, Dr. Norman Reed, Dr. Naowarat (Ann) Cheeptham