

ADSORPTION OF DNA TO IRON OXIDES

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Abstract

Understanding the properties of DNA adsorption to iron oxides would allow for the study of non-fossilizing organisms in the ocean sediment up to 200,000 years. Free floating environmental DNA in the water column adsorbs to aggregating minerals that form the next layer of sediment. Quantifying the rate of adsorption of DNA under different conditions such as pH, salinity and mineral type would allow future modelling of past ecosystems in the water column from the DNA found in sediment cores. This study explored the adsorption and desorption of DNA on two types of iron oxide: goethite and ferrihydrite. The amount of DNA adsorbed to iron oxide was determined by measuring the DNA remaining in the solvent on a spectrophotometer at 260nm. Similar to other studies that measured DNA adsorption to other minerals, DNA adsorption increased with decreasing pH and increasing salinity. Magnesium ions were twice as efficient as sodium ions in adsorbing DNA. Further research is proposed that would investigate factors required in creating an accurate model to quantify organisms in part communities in the water column.