CHARACTERIZATION AND TIMING OF THE AGARDHFJELLET FORMATION FROM TWO CO_2 SEQUESTRATION WELLS NEAR LONGYEARBYEN, SVALBARD

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Abstract

Black shales in the Agardhfjellet Formation, Svalbard, Norway are currently a topic of interest for two reasons: (1) they act as a seal for a series of CO_2 sequestration wells, and (2) they correlate with Upper Jurassic source rocks which have generated an enormous amount of hydrocarbon reserves in the Barents, North, and Norwegian Seas. The goals of this project will be to (1) identify and date the Oxfordian-Kimmeridgian chronostratigraphic boundary within the Agardhfjellet Formation using Re-Os geochronology, (2) describe and characterize the lithologies and organic matter present, (3) establish time lines between the Agardhfjellet Formation and other Upper Jurassic formations at a regional scale, and (4) use this information to enhance regional paleogeographic and paleoenvironmental interpretations.

In order to achieve these goals, several techniques will be used. The Re-Os geochronometer can be sensitive to a variety of depositional and diagenetic processes so it is important to understand specific characteristics of the Agardhfjellet Formation through (1) detailed mineralogical investigation (using SEM analysis of thin sections) and (2) chemical data such as trace elemental analysis (which can give rise to information regarding water chemistry at time of formation and/or the post depositional alteration of sediments), stable isotopic data (for indicators of paleoclimate) and TOC and pyrolysis measurements (for hydrocarbon maturity and possible types of organic matter). The combination of these data not only provide additional information for the paleoenvironmental/paleogeographic interpretations, but contribute to a robust interpretation of Re-Os data for the Agardhfjellet Formation.

AAPG Search and Discovery Article #90249 2015 Grants-in-Aid Projects