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## **Use of Iodine Surface Geochemistry for Exploration of Silurian Reefs in the Illinois and Michigan Basins**

The concept of surface geochemistry as an exploration tool to find new petroleum reservoirs is based on the concept of vertical migration. Based on this concept, petroleum migrates to the surface from a petroleum reservoir at depth along micro-pores, micro-fractures and micro-unconformities. The petroleum compounds and their by-products in the soil substrate will eventually vent to the atmosphere where they are broken down by plant and bacterial action and react with other elements and compounds. The presence or absence of anomalous surface geochemical conditions directs the explorationist to either proceed forward to define a prospect with potential drilling or to abandon the prospect. Surface geochemistry, if done properly, inherently reduces risk and increases success. Iodine has a unique association with thermally cracked hydrocarbons. Where petroleum is present in the soil or in the subsurface anomalous amounts of iodine are present. Iodine does not seem to bond with biogenic methane. Analyzing for iodine from soil samples allows for a cost effective exploration tool to locate and define the approximate location of Silurian Age reefs in the subsurface. This allows high grading of prospect areas and a more effective use of exploration dollars in shooting seismic and leasing. Examples of successful iodine surveys will be presented from Illinois, Michigan and Ontario where iodine has been effectively used and successful.