Modeling in Formation of Tornadoes by Electrochemistry in Hydrocarbon Diffusion and Oxidation out of Petroleum Deposits

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Modeling in formation of tornadoes is attempted based on reports (Pirson, 1981, R. Tomkins, 1990) that most of oil and gas deposits are surrounded with a negatively charged ion envelope. Based on the fact, a sequential process may be reasonablly proposed that (1) the negatively charged envelope around an oil or gas deposit may be attributed to counter-diffusion of hydrocarbons from the deposit and oxygen from ground surface air, (2) a redox reaction may be occurred between the diffusing hydrocarbons and oxygen in the vertical subterranean column above the deposit, and (3) a vertical subterranean electrostatic dipolarization may be formed across between the deposit as a negative region and the ground surface localized above the deposit as a positive region. It follows as a consequence that a petroleum deposit tends to form a gigantic subterranean fuel cell, a Fuel Cell Model.

Also, the localized positively charged ground surface may provides (1) induction of a negatively charged bottom of a thunder cloud overpassing above the deposit by an electrostatic proximity effect and (2) the electrostatic force may pull down the cloud bottom to form so-called a supercell or a wall cloud, a downwardly projected rotating cloud disk on the thunder cloud bottom, followed by formation of a funnel aloft out of the wall cloud and a tornado touching down the ground, an Electrostatic Proximity Model.

The present model in formation of tornado above a petroleum deposit, therefore, comprises a Fuel Cell Model and an Electrostatic Proximity Model.