Effects of Microwave Radiation on Oil Recovery

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Abstract

A variety of oil recovery methods have been developed and applied to mature and depleted reservoirs in order to improve the efficiency. Microwave radiation oil recovery method is a relatively new method and has been of great interest in the recent years. Crude oil is typically co-mingled with suspended solids and water. To increase oil recovery, it is necessary to remove these components. The separation of oil from water and solids using gravitational settling methods is typically incomplete. Oil-in-water and oil-water-solid emulsions can be demulsified and separated into their individual layers by microwave radiation. The data also show that microwave separation is faster than gravity separation and can be faster than conventional heating at many conditions. After separation of emulsion into water and oil layers, water can be discharged and oil is collected. High-frequency microwave recycling process can recover oil and gases from oil shale, residual oil, drill cuttings, tar sands oil, contaminated dredge/sediments, tires and plastics with significantly greater yields and lower costs than are available utilizing existing known technologies. This process is environmentally friendly, fuel-generating recycler to reduce waste, cut emissions, and save energy. This paper presents a critical review of Microwave radiation method for oil recovery.