

OIL-SHALE'S PROPERTIES, PECULIARITIES, AND POSSIBILITIES. John Ward Smith,
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The world's oil shales represent a tremendous store of fossil fuel energy, estimated to be many times larger than that offered by coal. Oil shale has an immediate advantage in that its primary product is oil which can feed directly into our established consumption patterns. Although oil shale is difficult to define unambiguously, oil shale is best described as a sedimentary rock containing solid, combustible organic matter in an inorganic mineral matrix. The organic matter, frequently called kerogen, is largely insoluble in petroleum solvents, but decomposes when heated to yield oil, gas, water, and residual carbon. World resources are summarized and the history and status of world-wide development efforts outlined. Oil shale is a strange rock whose properties are modified and even controlled by its organic matter content. Density varies with organic volume - general oil-shale relationships are discussed. The hydrogen available to make hydrocarbons in the organic matter controls how much oil can be produced from any oil shale. A general relationship between C-H ratio and conversion of organic matter to oil is described. The organic matter of the oil shales in United States' Green River Formation is extremely rich in hydrogen. This deposit in Colorado, Utah, and Wyoming is the World's largest oil-shale resource. Its physical, chemical and thermal character and properties are summarized. Common misconceptions about the shale are debunked - it does not increase in size when heated to produce oil, it does not have liquid oil in it, and the organic matter differs very little throughout the formation. Dawsonite and nahcolite, minerals capable of yielding co-products with the oil from oil shale are described and the variation in the nature of the formation leading to application of different development methods at different sites is described.