

## **Recent shale oil upgrading results using molten sodium**

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Several different types of oil from retorted oil shale have been processed at the laboratory scale using molten sodium including Uinta Basin, Piceance Basin, Australian and Jordanian. Depending on the source and the retorting process, the feedstock varied considerably. Incoming sulfur in the 5 different samples ranged from 0.25% - 13% while nitrogen varied from 0.41% - 1.9% and API gravity varied from 15.3 - 45.1. Although some of the samples were upgraded with molten sodium earlier, the various samples were reprocessed under similar conditions, typically lower temperature than before for more comparable results and to minimize thermal cracking. The amount of sodium used in each case varied depending on the sulfur and nitrogen content, where 2 moles of sodium were added for every mole of sulfur and 3 moles of sodium were added for every mole of nitrogen contained in the oil. Sodium salts from the process were separated from the oil and electrolyzed to regenerate the sodium. A brief review of the process, our results and conclusions will be presented.