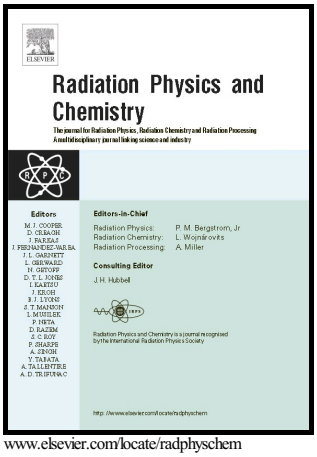
Author's Accepted Manuscript



www.elsevier.com/locate/radphyschem

Sulfur transfer in the distillate fractions of Arabian crude oils under gamma-irradiation

Ahmed A. Basfar, Yasser S. Soliman, Turki S. Alkhuraiji

PII: S0969-806X(16)30396-6
DOI: http://dx.doi.org/10.1016/j.radphyschem.2017.01.038
Reference: RPC7394

To appear in: *Radiation Physics and Chemistry*

Received date: 19 September 2016
Revised date: 28 December 2016
Accepted date: 31 January 2017

Cite this article as: Ahmed A. Basfar, Yasser S. Soliman and Turki S. Alkhuraiji, Sulfur transfer in the distillate fractions of Arabian crude oils under gamma irradiation, *Radiation Physics and Chemistry* http://dx.doi.org/10.1016/j.radphyschem.2017.01.038

Sulfur transfer in the distillate fractions of Arabian crude oils under gamma-irradiation

Ahmed A. Basfar, Yasser S. Soliman and Turki S. Alkhuraiji*

King Abdulaziz City for Science and Technology, Nuclear Science Research Institute, National Center for Irradiation Technology, P.O. Box 6086 Riyadh 11442, Saudi Arabia.

***Corresponding author.** E-mail: khuraiji@kacst.edu.sa

Abstract

Desulfurization of light distillation fractions including gasoline, kerosene and diesel obtained from the four Arabian crude oils (heavy, medium, light and extra light) upon γ-rays irradiation to different doses was investigated. In addition, yields vol. %, FTIR analysis, kinematic viscosity and density of all distillation fractions of irradiated crude oils were evaluated. Limited radiation-induced desulfurization of those fractions was observed up to an irradiation dose of 200 kGy. FTIR analysis of those fractions indicates the absence of oxidized sulfur compounds, represented by S=O of sulfone group, indicating that γ-irradiation of the Arabian crude oils at normal conditions does not induce an oxidative desulfurization in those distillation fractions. Radiation-induced sulfur transfer decreases by 28.56% and increases in total sulfur by 16.8% in Arabian extra light oil and Arabian medium crude oil respectively.

Keywords: Arabian crude oils, Desulfurization, Distillation fractions, Gamma radiation.