1. Record Nr. UNINA9910974811503321

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Titolo	Petroleum radiation processing / / Yuriiy Zaikin, Raissa Zaikina
Pubbl/distr/stampa	Boca Raton : , : CRC Press, , [2014] ©2014
ISBN	9781040073162 1040073166 9780429168307 0429168306 9781466593107 1466593105
Edizione	[1st edition]
Descrizione fisica	1 online resource (370 p.)
Classificazione	SCI013060SCI055000TEC009010
Disciplina	665.5/33
Soggetti	Cracking process Radiation chemistry
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Front Cover; Contents; Authors; Introduction; Chapter 1: Theory of Radiation-Induced Cracking Reactions in Hydrocarbons; Chapter 2: Experimental Studies of Radiation-Thermal Cracking in Hydrocarbons; Chapter 3: Methods for Petroleum Processing Based on Radiation-Thermal Cracking; Chapter 4: Complex Radiation-Thermal Treatment and Radiation Ozonolysis of Petroleum Feedstock; Chapter 5: High Dose-Rate Radiation Processing of Petroleum Feedstock in a Wide Temperature Range; References; Back Cover
Sommario/riassunto	Introduction: Radiation methods for petroleum processing have attracted the attention of researchers since the early 1960s when the discovery of the phenomenon of radiation-thermal cracking presented an opportunity of using ionizing irradiation for high-rate deep oil processing. New technologies for high-viscous and heavy oil processing were developed with technical advances in the 1990s. These technologies are now ready to be scaled up for industrial applications. Radiation-thermal cracking of oil feedstock represents a solution to

overcoming many acute problems of the oil industry. However, processes based on radiation-thermal cracking require heightened temperatures that are usually about 40% lower than those characteristic for thermocatalytic cracking. This is acceptable for many refinery operations; however, other applications, such as oil upgrading near the sites of its extraction, require radical reduction of the process temperature. Observation of radiation-induced chain cracking reactions in hydrocarbons at lowered temperatures initiated the development of improved technological approaches, combining the advantages of radiation-thermal cracking and low-temperature feedstock processing. Progress in radiation technologies for oil processing demanded more detailed elaboration of the theory of thermally and radiation-induced self-sustaining cracking reactions. Researchers still face serious difficulties in the practical application of the theory to experimental data interpretation--