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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--