



US010047283B2

(12) **United States Patent**
Kanj et al.

(10) **Patent No.:** **US 10,047,283 B2**

(45) **Date of Patent:** ***Aug. 14, 2018**

(54) **CARBON-BASED FLUORESCENT TRACERS AS OIL RESERVOIR NANO-AGENTS**

(52) **U.S. Cl.**
CPC **C09K 11/06** (2013.01); **B82Y 20/00** (2013.01); **C01B 32/15** (2017.08); **C07C 215/08** (2013.01);

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(58) **Field of Classification Search**
None
See application file for complete search history.

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 8 days.

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This patent is subject to a terminal disclaimer.

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(21) Appl. No.: **15/351,096**

(22) Filed: **Nov. 14, 2016**

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(65) **Prior Publication Data**

US 2017/0058192 A1 Mar. 2, 2017

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Related U.S. Application Data

(60) Continuation of application No. 14/627,404, filed on Feb. 20, 2015, now Pat. No. 9,528,045, which is a (Continued)

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(51) **Int. Cl.**
C09K 11/06 (2006.01)
C07H 15/04 (2006.01)

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(57) **ABSTRACT**
The present invention relates to carbon-based fluorescent nano-agent tracers for analysis of oil reservoirs. The carbon-based fluorescent nano-agents may be used in the analysis of the porosity of a formation. The nanoagents are suitable for injection into a petroleum reservoir and may be recovered from the reservoir for the determination of hydrocarbon flow rates and retention times.

14 Claims, 13 Drawing Sheets

