



US007497943B2

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

(10) **Patent No.:** US 7,497,943 B2
(45) **Date of Patent:** Mar. 3, 2009

(54) **ADDITIVES TO ENHANCE METAL AND AMINE REMOVAL IN REFINERY DESALTING PROCESSES**

3,023,160 A 2/1962 Stedman
3,150,081 A 9/1964 Haslam
3,167,500 A 1/1965 Payne
3,322,664 A 5/1967 Paterson et al.

(75) Inventors: **Tran M. Nguyen**, Houston, TX (US);
Lawrence N. Kremer, The Woodlands, TX (US); **Jerry J. Weers**, Richmond, TX (US)

(Continued)

FOREIGN PATENT DOCUMENTS

WO WO 00/52114 9/2000

(73) Assignee: **Baker Hughes Incorporated**, Houston, TX (US)

OTHER PUBLICATIONS

WPI/Derwent Abstract of JP 11241074, 1999.

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 501 days.

(Continued)

Primary Examiner—Glenn Caldarola

Assistant Examiner—Prem C. Singh

(74) Attorney, Agent, or Firm—Madan, Mossman & Sriram PC

(21) Appl. No.: 10/649,921

(22) Filed: Aug. 27, 2003

(57) **ABSTRACT**

(65) **Prior Publication Data**

US 2004/0045875 A1 Mar. 11, 2004

It has been discovered that metals and/or amines can be removed or transferred from a hydrocarbon phase to a water phase in an emulsion breaking process by using a composition that contains water-soluble hydroxyacids. Suitable water-soluble hydroxyacids include, but are not necessarily limited to glycolic acid, gluconic acid, C₂-C₄ alpha-hydroxy acids, poly-hydroxy carboxylic acids, thioglycolic acid, chloroacetic acid, polymeric forms of the above hydroxyacids, poly-glycolic esters, glycolate ethers, and ammonium salt and alkali metal salts of these hydroxyacids, and mixtures thereof. The composition may also include at least one mineral acid to reduce the pH of the desalter wash water. A solvent may be optionally included in the composition. The invention permits transfer of metals and/or amines into the aqueous phase with little or no hydrocarbon phase undercarry into the aqueous phase. The composition is particularly useful in treating crude oil emulsions, and in removing calcium and other metals therefrom.

Related U.S. Application Data

(60) Provisional application No. 60/407,139, filed on Aug. 30, 2002.

(51) **Int. Cl.**
C10G 45/00 (2006.01)

(52) **U.S. Cl.** 208/251 R; 208/179; 208/181; 208/187; 208/254 R; 585/3

(58) **Field of Classification Search** 208/251 R, 208/254 R, 252, 179, 181, 187, 188; 585/3
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2,175,095 A 10/1939 Stoesser
2,744,853 A 5/1956 Kavanagh et al.
2,778,777 A 1/1957 Powell

25 Claims, 1 Drawing Sheet

Amine/Ammonia Partitioning Across Desalters As a Function of pH

