US006299711B1

(12) **United States Patent**

(10) **Patent No.: US 6,299,711 B1**

(45) **Date of Patent: Oct. 9, 2001**

77,568

(54) **GAS-GENERATING LIQUID COMPOSITIONS (OXSOL 3)**

(75) Inventor:

(73) Assignee: **The United States of America as represented by the Secretary of the Navy**, Washington, DC (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/664,703**

(22) Filed: **Sep. 19, 2000**

Related U.S. Application Data

(63) Continuation of application No. 09/447,274, filed on Nov. 23, 1999.

(51) **Int. Cl.**[7] **C06B 31/28**; C06B 31/00

(52) **U.S. Cl.** **149/46**; 149/45

(58) **Field of Search** 149/46, 45

(56) **References Cited**

U.S. PATENT DOCUMENTS

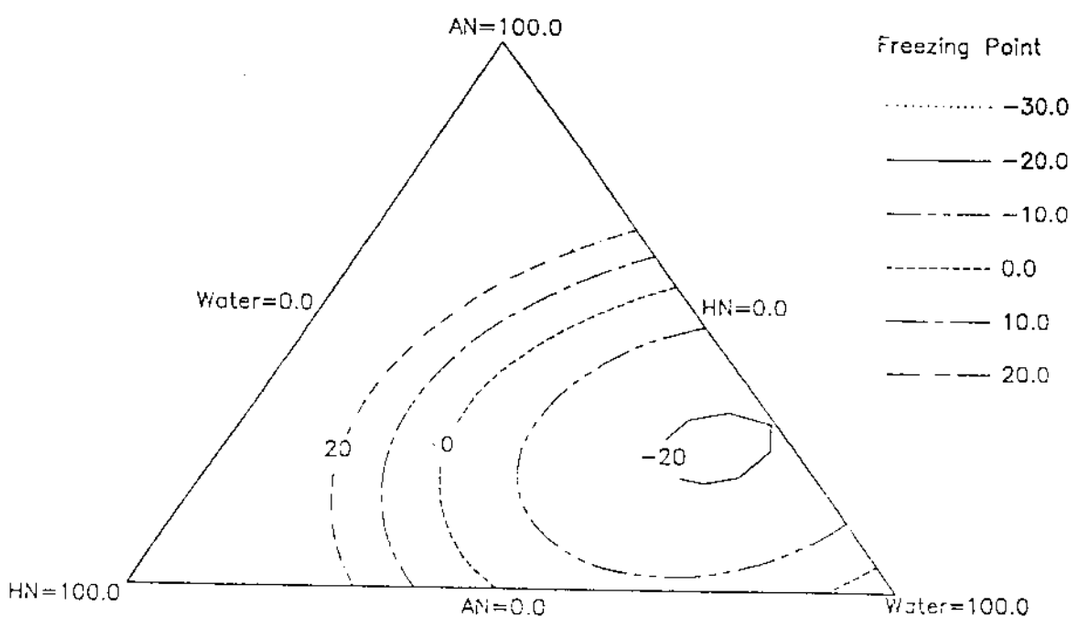
3,419,444	*	12/1968	Maes	149/1
3,658,609	*	4/1972	Lum et al.	149/36
3,768,410	*	10/1973	Maes et al.	102/24
3,861,138	*	1/1975	Bridgeforth, Jr. et al.	60/217
3,888,159	*	6/1975	Elmore et al.	89/7
3,916,792	*	11/1975	Elmore et al.	102/38
3,923,565	*	12/1975	Sakai et al.	149/60
4,042,431	*	8/1977	Friant et al.	149/36
4,090,895	*	5/1978	Outten	149/22
4,161,104	*	7/1979	Ladacki	60/218
4,620,415	*	11/1986	Schmidt	60/219
5,734,124	*	3/1998	Bruenner et al.	149/36
5,837,931	*	11/1998	Bruenner	149/109.6
5,847,315	*	12/1998	Katzakian, Jr. et al.	149/19.91
6,001,197	*	12/1999	Wagaman	149/45

* cited by examiner

Primary Examiner—Charles T. Jordan
Assistant Examiner—Aileen J. Baker
(74) *Attorney, Agent, or Firm*—Mark Homer

(57) **ABSTRACT**

A family of water-based gas-generating liquid compositions is described. A composition of the present invention includes: a first compound which may be hydrazinium mononitrate or methylhydrazinium mononitrate; ammonium nitrate; and water. Compositions of the present invention may be mixed with fuels to make monopropellants or used in bipropellant or hybrid systems. Alternative uses of the present invention include breathable gas generation.

17 Claims, 2 Drawing Sheets

Freezing Points For OXSOL 3 Formulations