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(54) Method of disposal of radioactive waste in "synthetic rock"

(57) The invention relates to the disposal of radioactive waste by a modified sol-gel method by enclosing it in durable ceramic crystallographic structures of ceramic synroc materials of type perovskite.

The method according to the invention lies in the fact that to the previously prepared chlorine-free solution of colloidal sol, preferably $Ti(NO_3)_4$, the complexing compound is added, preferably ascorbic acid ASC, relative to the sum of the moles of metal from 0.1 to 0.3 and introduces calcium carbonate and elements included in the high-level radioactive waste, in the form of carbonates or nitrates, especially strontium, cobalt, cesium and neodymium, in a molar ratio of from 2% to 14% of the individual metals (Me), thereby replacing from 2% to 14% by mol of introduced Ca^{2+}.The thus obtained sol is evaporated, dried and subjected to heat treatment and is eventually subjected to XRD and IR analysis, then the precursor of the synroc is pelletized and calcined at a temperature of 1200°C for 2h.

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EUROPEAN SEARCH REPORT

Application Number
EP 13 17 6463

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X,D	A.E. RINGWOOD ET AL: "Immobilization of high-level nuclear reactor wastes in SYNROC: A current appraisal", NUCLEAR AND CHEMICAL WASTE MANAGEMENT, vol. 2, no. 4, 1 January 1981 (1981-01-01), pages 287-305, XP055178468, ISSN: 0191-815X, DOI: 10.1016/0191-815X(81)90055-3	1	INV. G21F9/16 G21F9/34 G21F9/30
A	* page 288, column 2, line 12 - page 289, column 2, line 50 *	2-5	
A	ANDRZEJ DEPTULA ET AL: "Sol-Gel Processing of Silica Nuclear Waste Glasses", NEW JOURNAL OF GLASS AND CERAMICS, vol. 01, no. 03, 1 January 2011 (2011-01-01), pages 105-111, XP055178296, ISSN: 2161-7554, DOI: 10.4236/njgc.2011.13015 * page 1, column 1, line 1 - page 2, column 1, line 22 *	1-5	TECHNICAL FIELDS SEARCHED (IPC) G21F
A	RUI ZHU ZHANG ET AL: "Immobilization of Radioactive Wastes into CaTiO₃ Synroc by the SHS Method", ADVANCED MATERIALS RESEARCH, vol. 152-153, 27 October 2010 (2010-10-27), pages 315-319, XP055178338, DOI: 10.4028/www.scientific.net/AMR.152-153.315 * abstract * * page 316, line 4 - page 317, line 9 *	1-5	

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	24 March 2015	Sewtz, Michael

CATEGORY OF CITED DOCUMENTS

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A	J. M. MCHALE ET AL: "Instantaneous Formation of Synroc-B Phases at Ambient Pressure", MRS PROCEEDINGS, vol. 412, 1 January 1995 (1995-01-01), XP055178281, DOI: 10.1557/PROC-412-297 * page 298, line 25 - page 299, line 17 * -----	1-5	

TECHNICAL FIELDS SEARCHED (IPC)

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