Program	**PN II – Partnerships in prioritised areas**. Contract : 139/2012
Project Leader Institution (CO)	"Ilie Murgulescu" Institute of Physical Chemistry, Romanian Academy
Project title (ENG):	**Oxide nanomaterials with photocatalytic properties applied in advanced degradation of xenobiotic compounds from water**
Project title (RO):	**Nanomateriale oxidice cu proprietati fotocatalitice aplicate in degradarea avansata a compusilor xenobiotici din apa**
Duration	2012-2016
Responsible partner	Ph.D. eng. Nitoi Ines
Summary (short description) ENG	The concept of the project is to synthesis and use sol-gel doped-TiO_2 Nano powders photo catalysts as friendly materials for the environment in the advanced degradation of xenobiotic compounds like nitro aromatics from wastewater resulted from industrial activities. Project results were concretized by the followings: -Systematic study of the sol-gel heavy metal doped TiO_2 Nano powders photo catalysts with potential application in the advances degradation of xenobiotics like nitro aromatics; -Development of a soft chemistry sol-gel method in order to obtain heavy metal (Fe, Co, Ni) doped-TiO_2 Nano powders followed by their morphological and structural characterization; -Correlation study between the synthesis method/structure/ properties/functionality of photo catalysts and the kinetic parameters of nitro aromatics advanced degradation; -Evaluation of the photocatalytic capacity of the obtained Nano powders in report to aromatic nitro compounds degradation and catalyst selection; -Setting up treatment technology of wastewater with 2, 4, 6-trinitrotoluene content (tens mg/l), and establishing of optimal operating parameter able to assure advanced pollutant removal (99.98%). Proposed technology, tested on solar photocatalytic pilot installation, consists of: *heterogeneous photo catalysis* (pH = 7, Fe -TiO_2 dose = hundreds mg/l, reaction time / mg pollutant removed ≤ tens min), *photo catalyst separation and recirculation*.
Summary (short description) RO	Scopul proiectului este de obtinere a fotocatalizatorilor de tipul nanopulberi sol-gel pe baza de TiO_2 nedopat sau dopat si utilizare lor ca materiale prietenoase mediului in degradarea avansata a compusilor xenobiotici, cum sunt nitroderivatii, prezenti in apele reziduale provenite din activitati industriale. Principalele rezultate obtinute au fost urmatoarele: -Studiul sistemetic al fotocatalizatorilor de tipul nanopulberi sol-gel pe baza de TiO_2 nedopat sau dópate cu metale grele, cu potential de utilizare in degradarea avansata a xenobioticelor de tipul derivatilor nitoaromatici; -Elaborarea unei metode chimice de obtinere nanopulberi sol-gel pe baza de TiO_2 nedopat sau dopat cu metale grele(Fe, Co, Ni) si caracterizarea lor morfológica si functionala; -Studiu de corelare dintre metoda de sinteza/structura/propritati/ functionalitatea fotocatalizatorilor si parametrii cinetici de degradare avansata a nitroderivatilor aromatici; -Evaluarea capacitatii fotocatalitice a nanopulberilor obtinute in raport cu degradarea compusilor nitroaromatici si selectare catalizator; -Definitivarea tehnologiei de tratare a apelor reziduale cu continut de 2,4,6-trinitrotoluen(zeci mg/l) si stabilirea parametrilor optimi de operare care asigura indepartarea avansata a poluantului (99,98%).Tehnologia propusa, testat pe instalatie solara fotocatalitica pilot, consta in: *fotocataliza heterogena* (pH = 7, Fe -TiO_2 doza = sute mg/l, timp reactie / mg poluant indepartat ≤ zeci min), *separare si recirculare fotocatalizator*

Dissemination of results	
Full-paper ISI	M., Raileanu, M., Crisan, **I., Nitoi**, A., Ianculescu, P., Oancea, D., Crisan, L., Todan, TiO_2-based nanomaterials with photocatalytic properties for the advanced degradation of xenobiotic compounds from water. A literature survey, Water Air and Soil Pollution, Vol. 224, No.6, No.articol 1548, 45 pages, 2013
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Conferences (platform, poster, abstract / full-paper)	P., Oancea, **I., Nitoi,** Degradation of Xenobiotics using doped-TiO_2 photocatalysts, a XXXII a Conferinta Nationala de Chimie, Calimanesti-Caciulata, Romania, October 2012
	P. Oancea, **I. Nitoi,** I. Cristea, N. Dragan D. Crisan, M. Raileanu, M. Crisan, Light-induced advanced degradation of nitrobenzene by metal doped TiO_2 photocatalyst, International Conference of Physical Chemistry - Romphyschem 15, Bucharest,Romania, September 2013
	I., Nitoi, P., Oancea, M., Raileanu, M., Crisan, **I.,Cristea,** Application of TiO_2 - based photocatalysts for xenobiotics degradation from water: Nitrobenzene case study, Internatioal Symposium "The Environment and Industry", SIMI, Bucharest, Romania,October 2013
	I., Nitoi , P.,Oancea, M., Crisan, Application of heavy metal (Fe, Co, Ni) doped TiO_2 photocatalysts for nitroaromatic compounds degradation, Romanian Research Aplicarea fotocatalizatorilor pe baza de TiO_2 dopati cu metale grele (in degradarea nitroderivatilor aromatici, Romanian Research Market, Bucuresti, Romania, October 2014
	M., Raileanu, M., Crisan, A., Ianculescu, **I., Nitoi**, P., Oancea, S., Somacescu, L., Todan, Comparative structural study of sol-gel cobalt and nickel doped TiO_2 nanopowders with photocatalytic properties, 10th International Conference on Physics of Advanced Materials (ICPAM-10), Iasi, Romania, September 2014

Conferences (platform, poster, abstract / full-paper)	**I., Nitoi**, L.A., Constantin, P., Oancea, I., Cristea, M., Crisan,TiO_2 solar light photocatalysis a promising treatment method of wastewater with Trinitrotoluene content, Internationaly Multidisciplinary Scientific GeoConferences SGEM „The world sources of geosciences", Albena, Bulgaria, June 2015
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