

Project work plan

Phase no./ objective/ activity	Results delivered/ phase (P)	Delivery date	Total budget (550.000 lei) Phase budget
	Objective name (O)		
	Activity name (A)		
Phase 1 (single phase)	Results delivered/ phase: - Literature review, - Synthesis protocols, - Investigation set (XRD, BET, TG-DSC, DRS etc.), - Abstract draft, - Paper draft, - Development of the project web site, in English, - Activity report.	31/12/2015	60.588 lei
Objective 1.1	Combustion synthesis and characterization of NIR reflective ZnAl ₂ O ₄ spinel-based (nano) pigments.		
A 1.1.1	Elaboration of a literature review, which integrates the most recent results in the field of NIR reflective spinel (ZnAl ₂ O ₄)-pigments synthesis, properties and applications.		
A 1.1.2	Recipe design and finding the optimum conditions for the preparation of ZnAl ₂ O ₄ via combustion synthesis: thermodynamic calculation of standard enthalpy of reaction and adiabatic temperature, using metal nitrates and different fuel mixtures, increasing the combustion temperature by the addition of NH ₄ NO ₃ .		
A 1.1.3	Sample characterization: TG-DTA, XRD, UV-VIS-NIR, CIEL*a*b*, FT-IR, S _{BET} , SEM-EDX, thermal imaging. Results interpretation and recipe optimization.		
Objective 1.2	Management, communication, dissemination and visibility.		
A 1.2.1	Results processing and elaboration of scientific materials.		
A 1.2.2	Creating and updating a project web site, in English to increase the project visibility.		

A 1.2.3	Conducting the public procurement procedures. Monitoring / internal control of the implementation process.		
A 1.2.4	Preparation of the progress reports according to UEFISCDI specifications.		
Phase 2 (single phase)	Results delivered/ phase: <ul style="list-style-type: none"> - Synthesis protocols for pigments and coatings preparation, - Investigation set (XRD, BET, TG-DSC, DRS, etc.), - Abstract draft, - Paper draft, - 1 ISI paper accepted for publication, - Attending 2 international conferences, - Materials presented during conferences, - Course presentation on thermoreflective pigments, - Coordination of 1 graduation paper, - Project site update, - Activity report. 	31/12/2016	218.580 lei
Objective 2.1	Combustion synthesis, characterization and testing of NIR reflective ZnAl ₂ O ₄ spinel-based (nano) pigments, doped with different chromophores (Co ²⁺ , Cr ³⁺ , Fe ³⁺ , Cu ²⁺).		
A 2.1.1	Combustion synthesis of NIR reflective spinel-pigments, with different colours: blue (Zn _{1-x} Co _x Al ₂ O ₄), green (ZnAl _{2-x} Cr _x O ₄), brown (ZnAl _{2-x} Fe _x O ₄), blue-green (Zn _{1-x} Co _x Al _{2-y} Cr _y O ₄). Role of TiO ₂ and V ₂ O ₅ additions.		
A 2.1.2	Sample characterization: TG-DTA, XRD, UV-VIS-NIR, CIEL*a*b*, FT-IR, S _{BET} , SEM-EDX, thermal imaging, oil absorption. Study of the relationship between doping level – colour – NIR reflecting properties – synthesis conditions. Results interpretation and recipe optimization.		
A 2.1.3	Preparation of paints / coatings and testing their NIR reflecting potential. Recipe optimization.		
Objective 2.2	Management, communication, dissemination and visibility.		
A 2.2.1	Results processing and elaboration of scientific materials.		
A 2.2.2	Results dissemination and attending international conferences.		

A 2.2.2	Conducting the public procurement procedures. Monitoring / internal control of the implementation process.		
A 2.2.3	Project site update.		
A 2.2.4	Preparation of the progress reports according to UEFISCDI specifications.		
Phase 3 (single phase)	Results delivered/ phase: <ul style="list-style-type: none"> - Literature review, - Synthesis protocols for pigments and coatings preparation, - Investigation set (XRD, BET, TG-DSC, DRS, etc.), - Abstract draft, - Paper drafts, - 2 ISI papers accepted for publication, - 1 OSIM patent request, - Attending 2 international conferences, - Materials presented during conferences, - Coordination of 1 graduation paper, - Project site update, - Activity report. 	30/09/2017	270.832 lei
Objective 3.1	Combustion synthesis, characterization and testing of NIR reflective perovskite (nano) pigments based on LaAlO ₃ , doped with different chromophores (Cr ³⁺ , Fe ³⁺).		
A 3.1.1	Elaboration of a literature review, which integrates the most recent results in the field of NIR reflective perovskite (LaAlO ₃)-pigments synthesis, properties and applications.		
A 3.1.2	Recipe design and finding the optimum conditions for the preparation of LaAlO ₃ via combustion synthesis: thermodynamic calculation of standard enthalpy of reaction and adiabatic temperature, using metal nitrates and different fuel mixtures, increasing the combustion temperature by the addition of NH ₄ NO ₃ .		
A 3.1.3	Combustion synthesis of NIR reflective perovskite-pigments, with different colours: green (LaAl _{1-x} Cr _x O ₃), brown (LaAl _{1-x} Fe _x O ₃), dark brown (LaAl _{1-x-y} Cr _x Fe _y O ₃). Influence of TiO ₂ , Y ₂ O ₃ and V ₂ O ₅ additions.		
A 3.1.4	Sample characterization: TG-DTA, XRD, UV-VIS-NIR, CIEL *a*b*, FT-IR, S _{BET} , SEM-EDX, thermal imaging, oil absorption. Study of the relationship between doping level – colour – NIR reflecting properties – synthesis		

	conditions. Results interpretation and recipe optimization.
A 3.1.5	Preparation of paints / coatings and testing their NIR reflecting potential. Recipe optimization.
Objective 3.2	Management, communication, dissemination and visibility.
A 3.2.1	Results processing and elaboration of scientific materials.
A 3.2.2	Results dissemination and attending international conferences.
A 3.2.3	Conducting the public procurement procedures. Monitoring / internal control of the implementation process.
A 3.2.4	Project site update.
A 3.2.5	Preparation of the progress reports according to UEFISCDI specifications.