

*Title:* **Tin-antimony oxide nanocrystals as building blocks for thin film porous structures**

*Student:* Gonzalo Heredia Segarra

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*Supervisor/s:* Dr. Albert Figuerola Silvestre

*Departament de Química Inorgànica i Orgànica. Secció Química Inorgànica*

Dr. Pablo Guardia Giros

*Fundació Institut de Recerca en Energia de Catalunya - IREC*

Porous structures, gels and nanocrystals (NCs) are concepts that will be described throughout this project, ending with the novel idea of implementing NCs as building blocks to form porous structures of greater complexity. A bibliographic search about the state-of-the-art gels and aerogels synthesised using NCs ends with an explanation of the assembly processes that can be performed in the formation of suprastructures.

On the other hand, the experimental section exemplifies the concepts described in the introduction by carrying out a study on the stability of NCs and the synthesis of nanostructured gels using tin oxide doped with antimony NCs. With the experimental work, it was confirmed that NCs gelification using PO was not a valid technique for the synthesis of our gels due to the high stability of the NCs commercial sample. Later, an assessment about the possible destabilizing agents, capable of inducing the assembly of NCs, was performed. The conclusion was that NCs stability is related to pH. The synthesis of the gels was carried out with acid and basic solutions using hydrochloric acid (HCl) and sodium hydroxide (NaOH) as the reagents.

**Keywords:** Nanocrystals, Thin Films, nanocrystals assembly, gels, aerogels.