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## Non Photochemical Light Induced Nucleation

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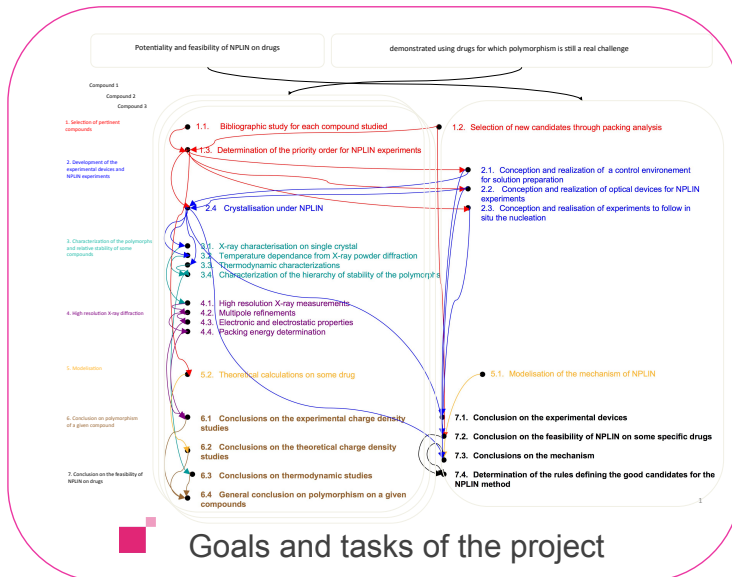
# NPLIN-4-drug

## Non Photochemical Light Induced Nucleation for drugs

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Journées Nationales en Nanosciences et Nanotechnologies 2011



Polymorphism studies important in the industrial pharmaceutical context

Method developed on urea [1], glycine [2], L-histidine [3], Hen Egg White Lysozyme [4], Pentyl cyanobiphenyl [5], KCl [6], protein [7]

1) Garetz B.A. et al. Phys. Rev. Lett. 1996, 18, 3475-3476; Yoshikawa H.Y. et al. Jpn. J. Appl. Phys. 2006; Yoshikawa H.Y. et al. Cryst. Growth Des. 2006, 6, 302-305; Yoshikawa H.Y. et al. Jpn. J. Appl. Phys. 2006, L234-236; [2] Zaccaro J., et al. Cryst. Growth Des. 2001, 1, 5-8; Garetz B.A. et al. Phys. Rev. Lett. 2002, 17, Matic J. Ph.D. 2005; Matic J. et al. Cryst. Growth Des. 2005, 5, 1565-1567; Sun X.Y. et al. Cryst. Growth Des. 2006, 6, 684-689; Sugiyama T. et al. Chem. Lett. 2007, 12, 1480-1481; Sun X.Y. Ph.D. 2008; Sugiyama T. et al. Chem. Lett. 2009, 15, 462-463; [3] Sun X.Y. et al. Cryst. Growth Des. 2008, 8, 1750-1722; [4] Lee I.S. et al. Cryst. Growth Des. 2008, 8, 4258-4261; [5] Sun X.Y. et al. Phys. Rev. Lett. 2009, 2, [6] Alexander A.J. et al. Cryst. Growth Des. 2009, 9, 958-963; Dullius A.J. et al. J. Am. Chem. Soc. 2009, 131, 11676-11677; Ward M.R. et al. Phys. Rev. Lett. 2009, 481, 25-28; [7] Murali R. et al. Appl. Phys. Lett. 2010, 96.

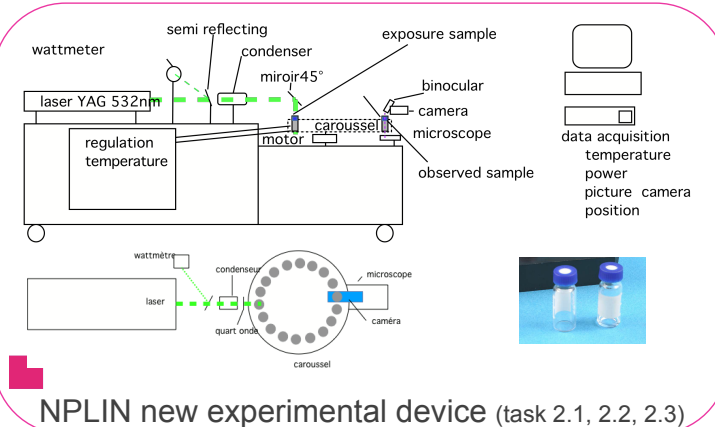
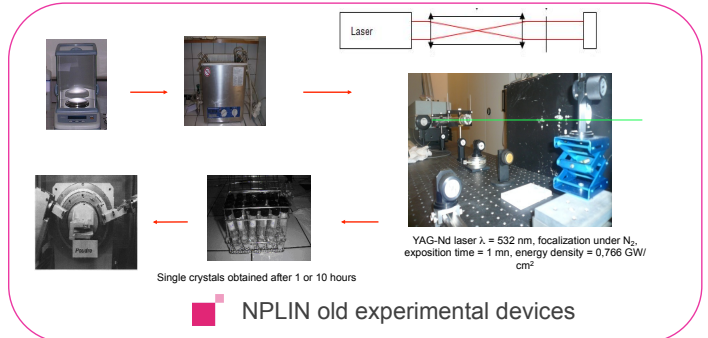
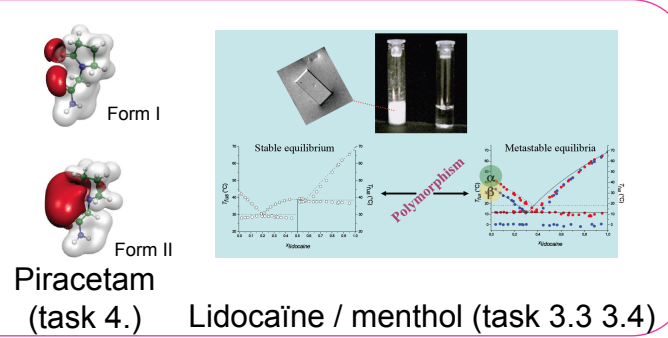
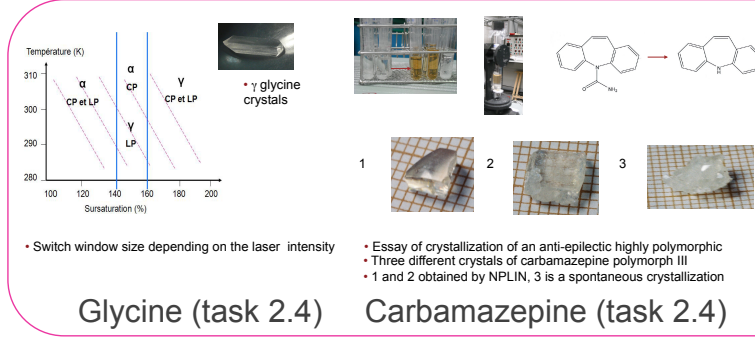
Context



- Co-existence of clusters of polarisability tensors of different symmetry: « disk-like » or « rod-like »
- Role of the induced dipolar moment depending on the clusters type

$$\frac{N(\alpha_{\text{parallèle}} - \alpha_{\text{perpendiculaire}})^2}{45\epsilon_0 n_0 K_b T}$$

Possible mechanism : Kerr effect



Production scientifique (publications, brevets)

[1] J. Prevost, H. Yang, F. Dumas, P. Scoufflaire, A. Spasojević – de Biré, « Non Photochemical Light Induced Nucleation. A tool to crystallize polymorphs on demand ? Application to carbamazepine » XVII Conference of Serbian Crystallographic Society, Ivajnica (Ser), juin 2010  
 [2] B. Clair, A. Iknj, H. Yang, F. Dumas, P. Scoufflaire, A. Spasojević – de Biré « Non Photochemical Light Induced Nucleation. A tool to crystallize polymorphs on demand ? » CPOSS meeting, London, Grande-Bretagne, 30 mars 2011  
 [3] A. Iknj, B. Clair, H. Yang, F. Dumas, P. Scoufflaire, A. Spasojević – de Biré « Non Photochemical Light Induced Nucleation. A tool to crystallize polymorphs on demand ? » IV congrès algérien de cristallographie, Kenchela, Algérie, 14-16 mai 2011,  
 [4] Y. Corvis, P. Espeau. « Physicochemical stability of solid dispersions of enantiomeric or racemic ibuprofen in stearic acid. » J. Pharm. Sci., 2011, 100, 5235-5243.  
 [5] M.H. Chambrier, N. Bouhnaïda, F. Bonhomme, S. Lebegue, J.M.Gillet, C. Jelsch, N.E. Ghermani « Electron and Electrostatic Properties of Three Crystal Forms of Piracetam » Cryst. Growth & Design, 2011, 11 (6), 2528-2539

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