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NPLIN-4-drug

Non Photochemical Light Induced Nucleation for drugs

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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-L236; [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**, *401*, 25-28; [7] Murali R. et al. *Appl. Phys. Lett.* **2010**, *96*.

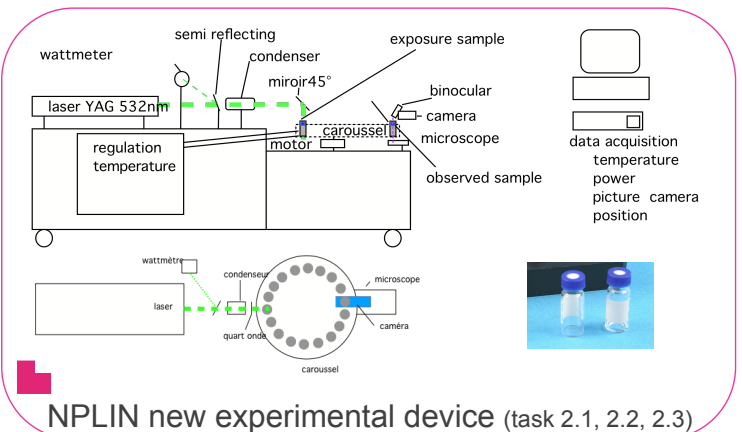
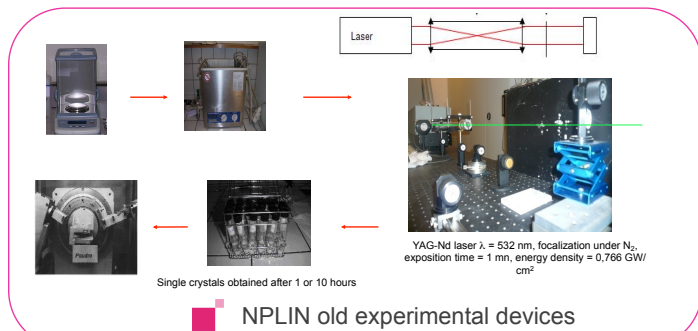
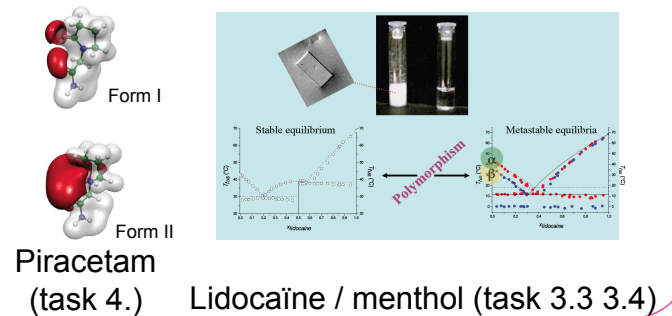
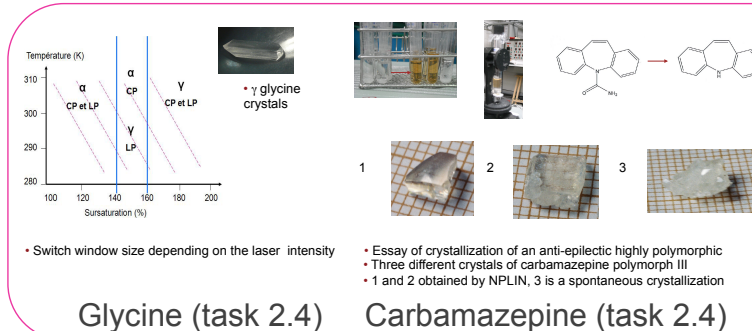
Context



- 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. Négrier, 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. Bouhmadia, 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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