PASCAL GUIRAUD

Chemical Engineering Professor
Transfer, Interface Mixing group
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CV

2001 - Chemical Engineering Professor
Biosystems and Process Engineering Laboratory (LISBP INSA Toulouse - France
President of the Occitanie Wastes Observatory (ORDECO 2009-2018)
Deputy-Director of LISBP (2009-2015)
Deputy-Director of Process Engineering and Environment Laboratory (LIPE 2003-2007)
Manager of the LIPE group Physical and Physico-Chemical Hydrodynamics of Multiphase Reactors (2003-2009)
Member of the board of Directors of FERMAT research federation (2005-2009)
Responsible for a collaborative joint research group Life and Process Sciences and Technologies for Environment (2003-2007 PPF LBB-LIPE)
Responsible INSA for the international n+i program for foreign students (2006-2010)

Before 0ctobre 2001
Full time researcher CNRS (National Center for Scientific Research)
Chemical Engineering Laboratory, ENSIACET – Institut National Polytechnique – Toulouse – France
Co-responsible for the research group two-phase contactors (1992 – 2001)
Assistant director of the joint research group FERMaT (Fédération pour l'Etude des Réacteurs et la Maîtrise Avancée des Transferts)

RESEARCH

Chemical engineering – multiphase reactors – CFD – local experimental techniques (LDA, PDA, LIF, PIV) – population balances – microphysics of dispersed media - Flotation, nanoparticles separation, microalgae harvesting

55 papers in international journals – Co-advising of 32 PhD
Member of the Defence Committee of 53 PhD, 11 as reviewer, 6 as president
Member of the International Scientific board for Flotation of the International Water Association since 2007

Chairman of the Organizing Committee of the 7the IWA Flotation Conference on Flotation for water and wastewater systems, Toulouse, France, 2016

TEACHING

Physical chemistry
Surfaces, interfaces and colloids
Two-phase flow modelling
Solvent extraction
Flotation

MORE RECENT PUBLICATIONS

1. Villegas, L. R. et al. Image processing for the experimental investigation of dense dispersed flows: Application to bubbly flows. International Journal of Multiphase Flow 111, 16–30 (2019).
2. Besson, A., Formosa-Dague, C. & Guiraud, P. Flocculation-flotation harvesting mechanism of Dunaliella salina: From nanoscale interpretation to industrial optimization. Water Research 155, 352–361 (2019).
3. Formosa-Dague, C., Gernigon, V., Castelain, M., Daboussi, F. & Guiraud, P. Towards a better understanding of the flocculation/flotation mechanism of the marine microalgae Phaeodactylum tricornutum under increased pH using atomic force microscopy. Algal Research 33, 369–378 (2018).
4. Colombet, D. et al. On single bubble mass transfer in a volatile liquid. International Journal of Heat and Mass Transfer 125, 1144–1155 (2018).
5. Zhang, M., Trompette, J.-L. & Guiraud, P. Role of Humic Acid in Enhancing Dissolved Air Flotation for the Removal of TiO2 Nanoparticles. Ind. Eng. Chem. Res. (2017). doi:10.1021/acs.iecr.6b04572
6. Zhang, M. & Guiraud, P. Surface-modified microbubbles (colloidal gas aphrons) for nanoparticle removal in a continuous bubble generation-flotation separation system. Water Research 126, 399–410 (2017).
7. 7.Chawaloesphonsiya, N., Guiraud, P. & Painmanakul, P. Analysis of cutting-oil emulsion destabilization by aluminium sulfate. Environmental Technology 1–34 (2017). doi:10.1080/09593330.2017.1332101
8. A.H. Shimako et al., "Environmental assessment of bioenergy production from microalgae based systems," Journal of Cleaner Production, vol. 139, pp. 51–60, décembre 2016.
9. Colombet, D., Legendre, D., Risso, F., Cockx, A. & Guiraud, P. Dynamics and mass transfer of rising bubbles in a homogenous swarm at large gas volume fraction. Journal of Fluid Mechanics 763, 254–285 (2015).
10. Y. Liu, M. Tourbin, S. Lachaize, and P. Guiraud, "Nanoparticles in wastewaters: Hazards, fate and remediation," Powder Technology, vol. 255, no. 0, pp. 149–156, Mar. 2014.
11. R. Hreiz, B. Sialve, J. Morchain, R. Escudié, J.-P. Steyer, and P. Guiraud, "Experimental and numerical investigation of hydrodynamics in raceway reactors used for algaculture," Chemical Engineering Journal, vol. 250, no. 0, pp. 230–239, 2014.
12. G. Angelov, P. Guiraud, and L. Boyadzhiev, "Dimensional changes of vegetal particles in contact with a solvent," Comptes Rendus De L Academie Bulgare Des Sciences, vol. 67, no. 5, pp. 665–670, 2014.
13. D. Colombet, A. Cockx, P. Guiraud, and D. Legendre, "Experiments and modelling of a draft tube airlift reactor operated at high gas throughputs," Chemical Engineering Science, vol. 104, no. 0, pp. 32–43, Dec. 2013.

14. D. Colombet, D. Legendre, A. Cockx, and P. Guiraud, "Mass or heat transfer inside a spherical gas bubble at low to moderate Reynolds number," International Journal of Heat and Mass Transfer, vol. 67, no. 0, pp. 1096–1105, Dec. 2013.
15. A. Besson and P. Guiraud, "High-pH-induced flocculation–flotation of the hypersaline microalga Dunaliella salina," Bioresource Technology, vol. 147, no. 0, pp. 464–470, Nov. 2013.
16. M. Zhang and P. Guiraud, "Elimination of TiO2 nanoparticles with the assist of humic acid: Influence of agglomeration in the dissolved air flotation process," Journal of Hazardous Materials, vol. 260, no. 0, pp. 122–130, Sep. 2013.
17. Y. Liu, M. Tourbin, S. Lachaize, and P. Guiraud, "Silica nanoparticles separation from water: Aggregation by cetyltrimethylammonium bromide (CTAB)," Chemosphere, vol. 92, no. 6, pp. 681–687, Jul. 2013.
18. Y. Liu, M. Tourbin, S. Lachaize, and P. Guiraud, "Silica Nanoparticle Separation from Water by Aggregation with AlCl3," Industrial & Engineering Chemistry Research, vol. 51, no. 4, pp. 1853–1863, Feb. 2012.
19. Z. Huang, D. Legendre, and P. Guiraud, "Effect of interface contamination on particle–bubble collision," Chemical Engineering Science, vol. 68, no. 1, pp. 1–18, Jan. 2012.
20. S. Khirani, P. Kunwapanitchakul, F. Augier, C. Guigui, P. Guiraud, and G. Hébrard, "Microbubble Generation through Porous Membrane under Aqueous or Organic Liquid Shear Flow," Ind. Eng. Chem. Res., Sep. 2011.
21. D. Colombet et al., "Experimental study of mass transfer in a dense bubble swarm," Chemical Engineering Science, vol. 66, no. 14, pp. 3432–3440, Jul. 2011.
22. [15]Z. Huang, D. Legendre, and P. Guiraud, "A new experimental method for determining particle capture efficiency in flotation," Chemical Engineering Science, vol. 66, no. 5, pp. 982–997, Mar. 2011.