

USA AND CANADIAN PATENTS

1. **"Nutrients Removal from Water/Wastewater using Simultaneous Treatment by Anammox/PAO Reactor (STAR)"** US Provisional Patent, Application NO.61/826,676 Manuel Alvarez Cuenca and Maryam Reza, Filed May 23,2013.
2. **"The Active Biological Contactor (ABC): A Modular Wastewater Treatment System"** US Patent Serial NO. US 11/423,215, Filed June 9, 2005. Manuel Alvarez Cuenca and Jose Alvarez
3. **"The Active Biological Contactor (ABC): A Modular Wastewater Treatment System"**, Canadian Patent Application No. 2,550,018, File 85445-101 MRW, June 9, 2006. Manuel Alvarez Cuenca and Jose Alvarez.
4. **"Compact Upright Bioreactor for the Elimination of Nutrients (CUBEN)"**, US Patent Serial No. 852068, Application No. 12/852,068, Filed August 6, 2010, Publication Number. US. 2012-0031836-A1, February 9, 2012 Manuel Alvarez Cuenca and Maryam Reza.
5. **"Compact Upright Bioreactor for the Elimination of Nutrients (CUBEN)"**, Canadian Patent Application, Filed July 26, 2011.(Canadian Intellectual Property Office CA-274 7288) Patent Pending) Manuel Alvarez Cuenca and Maryam Reza.

BOOK

"Pressurised Fluidized Bed Combustion" (Eds.) **M. Alvarez Cuenca and E.J. Anthony**, Chapman & Hall,(1995). 603 pages, 15 chapters.

The book discusses all aspects of PFBC technology, including fluidization fundamentals, plant design, sorbent and coal preparation and characterization, performance from a wide range of pilot-scale and full-scale demonstration units and economics. The text, the first of its kind, is written by experts from five countries and fifteen different organizations, representing electric utilities, universities, government agencies, equipment suppliers, and engineering firms.

BOOKS AND JOURNAL REVIEWS

- **"Fluidized Bed Technology: Principles and Applications"**, by J.R. Howard, Powder Technology 63, 103 (1990).

- **Reviewer on the subject of Fluidization and Water Treatment Technologies** for *The Canadian Journal of Chemical Engineering*, *American Institute of Chemical Engineering Journal*, *Powder Technology*, *Canadian Journal of Civil Engineering*, Elsevier Publishing Co., *Agua Latinoamérica*.

REFEREED PAPERS AND INDUSTRIAL REPORTS

1. **“Analysis of a Vertical Bioreactor for Denitrification and Biological Phosphorus Removal from Wastewater”**, M. Reza and M. Alvarez-Cuenca, *Chemical Engineering and Process Techniques*, Vol. 1, Issue 1, 1006 (August 2013) (R).
2. **“CUBEN, a Novel Bioreactor for the Removal of Nutrients: A Performance Evaluation”**, NATO Science for Peace and Security Series-C: *Environmental Security*, Springer in collaboration with NATO Public Diplomacy Division, 63-92, 2013 (R).
3. **“Municipal Solid Waste: The Canadian View”**, 4th Exhibition and Conference on Management of Solid and Hazardous Waste”, Conference Proceedings, Medellin, Colombia, November 16-19, 2011(R).
4. **“Biofilm Reactor Technologies for the Treatment of Highly Contaminated Industrial Wastewater”**, Conference Proceedings. *Exporesiduos IV*, Medellin Colombia, November 7-11, 2011 (R).
5. **“The Compact Upright Bioreactor for the Elimination of Nutrients (CUBEN)”**M. Alvarez Cuenca and M. Reza, 84th Annual Water Environment Federation Technical Exhibition and Conference (WEFTEC 2011), Conference Proceedings, Technical Program Session 75, Los Angeles, USA, October 19, 2011 (R).
6. **“The Compact Upright Bioreactor for the Elimination of Nutrients (CUBEN): Design and Construction”** Manuel Alvarez Cuenca and Maryam Reza, 2011 WEAO Conference, Toronto, Session 21, April 10-12, 2011 (R).
7. **“Performance Evaluation of a Novel Ceramic Membrane Bioreactor for Nutrient Removal”** North American Membrane Society (NAMS) Conference Proceedings, Las Vegas, Nevada, USA, June 5, 2011 (R).
8. **“Development of a three-phase fluidized bed reactor with enhanced oxygen transfer”** , L. Wan, M. Alvarez Cuenca, S.R. Upreti, A. Lohi., *Chemical Engineering and Processing: Process Intensification*, 49,2-8, (2010) (R).
9. **“Biodegradation of diesel fuel-contaminated wastewater using a three-phase fluidized bed reactor”** A. Lohi, M. Alvarez Cuenca, G. Anania, S.R. Upreti, L. Wan, *Journal of Hazardous Materials*, 105-111,(2008) (R).

10. **"Treatment of Municipal Wastewater, Landfill Leachate and Septic Tank Effluent with High-Performance Compact Plant"** Manuel Alvarez Cuenca, Eva Maria Palomero, Rakesh Desai, and Ana Maria Escribano. *Water Conditioning and Purification*, p 78-81, September (2006) (R).
11. **"Investigation of Gaseous Ozone as an Anti-fungal Fumigant for Stored Wheat"** Jiangning Wu, Huu Doan, and Manuel Alvarez Cuenca. *Journal of Chemical Technology and Biotechnology*. 81, 1288-1293, (2006) (R).
12. **"Anaerobic Biodegradation of Diesel Fuel-contaminated Wastewater in a Fluidized Bed Reactor"** M. Alvarez Cuenca, J. Vezuli, A. Lohi, and S.R. Upreti. *Bioprocess and Biosystems Engineering. Electronic Format DOI 10.1007/s00449-006-0053-4* (2006) (R).
13. **"Removal of Aqueous Phenol Using Immobilized Enzymes in a Bench-and Pilot-scale Three-Phase Fluidized Bed Reactor"** Lucila Ensuncho, Manuel Alvarez Cuenca, and Ray Legge. *Bioprocesses and Biosystems Engineering*, 27, 185-191, 2005 (R).
14. **"Performance of an Active Biological Contactor (ABC) : Treating Winery Wastewater,** Manuel Alvarez Cuenca, *Water Conditioning and Purification*, P 56-60, October 2004 (R).
15. **"Performance of an Activated Biological Contactor (ABC) in the Treatment of Winery Wastewater "** Manuel Alvarez Cuenca, Edwin Castilla, and Nilou Ghazi, *Proceedings of the 3rd International Specialized Conference on Sustainable Viticulture and Winery Wastes Management*, P.159-166, Barcelona, Spain, May 24-26, 2004 (R).
16. **"Convenio de Cooperación Académica entre la R.P.U de Ontario, Canada y la Universidad de Cartagena, Colombia: Una Acción Internacionalizadora"** Manuel Alvarez Cuenca and Raul Guerrero Torres. *Proceedings of the XXII Reunión Nacional de Facultades de Ingeniería, Cartagena de Indias, September 18-20, 2002.*
17. **"Biological Fluidized Bed Reactors: A Technology for Water Treatment"** by Edgar Quiñones, Manuel Alvarez Cuenca, Lambert Otten, and Mehrab Mehrvar, *Proceedings of the Environmental Forum Colombia-Canada, Cartagena de Indias, Colombia, May 24-26, 2000 (R).*
18. **"Nitrification and Denitrification in Rotating Biological Contactors"** by Edwin Castilla, Manuel Alvarez Cuenca, Lambert Otten, and Mehrab Mehrvar, *Environmental Forum Colombia-Canada, Cartagena de Indias, Colombia, May 24-26, 2000 (R).*
19. **"Performance Evaluation of Rotating Biological Contactors for Nitrification-Denitrification"** by M. Alvarez Cuenca, Raul Guerrero Torres, and Edgar Quiñones Bolaños, *Proceedings of the IAWQ Conference on Biofilm Systems, Session 11a, New York, October 17-20, 1999(R).*

20. **"Transfer of Evolving Technology: Some Observations on the Transfer of untested Technology"**. M. Alvarez Cuenca, session 19, 5th World Congress of Chemical Engineering, San Diego, California, pp 956-958, July 1996 (R).
21. **"Nitrification-Denitrification Studies in Rotating Biological Contactors"** Report by M. Alvarez Cuenca. Ontario Ministry of Environmental and Energy and CMS Group Inc. Environmental Technologies Program ET340. March 1996.
22. **"Struvite Prevention and Control at the Sludge Dewatering System of Metroworks Main Plant (Toronto)- Phase I"**. Report to the Ontario Ministry of the Environment, M. Alvarez Cuenca. February 1996.
23. **"Municipal Waste Management: Cost Effectiveness of Proper Hazard Control, Incinerators and Landfill"**. M. Alvarez Cuenca and R. Dixon, Health Canada, March 1995.
24. **"Rotating Biological Contactors: The Canadian Experience"** M. Alvarez Cuenca, T. Smith and A. Coelho Vianna. Proceedings of the Third International Conference on Waste Management in the Chemical and Petrochemical Industries. Salvador, Bahia, Brazil. Vol.2, 115, 20-23 October 1993 (R).
25. **"El Proyecto Escatron"**. Comett Seminar. Proceedings of the European Union Program on Combustion, Energy and the Environment. p. 185. Zaragoza, May 1989 (R).
26. **"La Planta Piloto de Combustión en Lecho Fluido a Presión: Elemento Esencial en el Desarrollo Español de esta Tecnología"** by M. Alvarez Cuenca, ENDESA Report, October, 1988.
27. **"Investigación Industrial en la Combustión de Lechos Fluidos a Presión"** by M. Alvarez Cuenca, E. Menendez Perez, and V. Bencomo. Proceedings of the V. Jornadas de Fluidización, Oviedo, Spain, p. 237, June 22-24, 1988 (R).
28. **"Métodos de Alimentación en Plantas de Lecho Fluido a Presión: Escatrón, Tidd, y Vartan Tres Experiencias"** by M. Alvarez Cuenca. Publicaciones de la Séptima Conferencia Sobre Planificación, Ahorro y Alternativas Energéticas. Zaragoza, 14-16 October, 1987 (R).
29. **"Spain takes to Pressurized Fluid Bed Combustion: A View to ENDESA's 80 MW Demonstration Plant"** "by E. Menendez, V. Bencomo, M. Alvarez Cuenca, 19th Proceedings of the International Conference on Fluidized Bed Combustion. Boston, 1, 278-281 (1987) (R).
30. **"Supercharged PFBC Gives High Efficiency and Low Emissions"** by M. Alvarez Cuenca and J.A.E. Menéndez Perez, Modern Power Systems, 7, May, 1987 (R).
31. **"Application of Plasma Technology to Selected Chemical Processes"** by M. Alvarez Cuenca, Ontario Hydro Research Division Report No. 85-119-K, 1985.

32. **"The Combustion Research Facility, Phase II - Commissioning with Pulverized Coal"** by M. Alvarez Cuenca, R. Mangal and R. Thampi, Ontario Hydro Research Division Report No. 84-226-K, 1984.
33. **"Mass Transfer Effects near the Distributor of Three-phase Fluidized Beds"** by M. Alvarez Cuenca, M.A. Nerenberg and A.A. Asfour, *Industrial Engineering Chemistry Fundamentals*, 23, 381-386, 1984 (R).
34. **"Combustibility Evaluation of Byron Creek Coals in the Combustion Research Facility"** by M. Alvarez Cuenca and R. Thampi, Ontario Hydro Research Division Report No. 84, 323 (1984) (Restricted Information).
35. **"Design of Fly Ash Sampling and Rapping Systems for the Combustion Research Facility"** by M. Alvarez Cuenca and C.M. Fung, Ontario Hydro Research Division Report No. 83-155-K, 1983.
36. **"Study of Fly Ash Buildup in Thunder Bay Hot-Side Electrostatic Precipitator"** by M. Alvarez Cuenca, Ontario Hydro Research Division Report No. 83-167-K, 1983.
37. **"Oxygen Mass Transfer in Three-phase Fluidized Beds Working at Large Flow Rates"** by M. Alvarez Cuenca, C.G.J. Baker, M.A. Bergougnou and M.A. Nerenberg, *Canadian Journal of Chemical Engineering*, 61, 58-68, 1983 (R).
38. **"The Combustion Research Facility Description and Operation Experience"** by M. Alvarez Cuenca, Ontario Hydro Research Division Report No. 82-222-K, 1982.
39. **"The Plug Flow Model in Three-Phase Fluidized Beds and Bubble Columns: Oxygen Mass Transfer at Large Flow Rates"** by M. Alvarez Cuenca and M.A. Nerenberg. *Canadian Journal of Chemical Engineering*, 59, 739-745, 1981 (R).
40. **"The Two-zone Model: A Quantitative Description of Mass Transfer in Bubble Columns and Three-phase Fluidized Beds"** by M. Alvarez Cuenca and M.A. Nerenberg. *Proceedings of the 6th International Fermentation Symposium. "Advances in Biotechnology"*, Pergamon Press 1, 477-482, 1981(R).
41. **"Oxygen Mass Transfer in Bubble Columns Working at Large Gas and Liquid Flow Rates"** by M. Alvarez Cuenca and M.A. Nerenberg, *American Institute of Chemical Engineers Journal*, 27, 66-73, 1981 (R).
42. **"Hydrocracking and Hydrogenation of Polynuclear Aromatics"** by M. Alvarez Cuenca, Imperial Oil Research Report, Sarnia, 1980 (Confidential Report).

43. **"Oxygen Mass Transfer in Bubble Columns"** by M. Alvarez Cuenca, C.G.J. Baker and M.A. Bergougnou, *Chemical Engineering Science*, 34, 1121-1127, 1980 (R).

ARTICLES BY INVITATION

1. **"Chemical Engineering: The Boundless and Fascinating Discipline"**, Editorial Article, in *Chemical Engineering and Process Techniques*, August 9, 2013
2. **"Keeping our Heads above Water: The Water Crisis, Rudimentary Technologies, and Rocket Science"**, Manuel Alvarez Cuenca in *Canadian Chemical News*, July-August 2003. (By Invitation)
3. **"Pressurized Fluidized Bed Combustion"** M. Alvarez Cuenca, *Canadian Chemical News*, pp. 18-19, November-December 1996. (By invitation)
4. **"El Impacto Ambiental de la Pequeña y Mediana Empresa en los Recursos Hídricos de Colombia"**. M. Alvarez Cuenca, Henry Maury Ardila and Diana Mosquera. *Agua Latinoamérica*, pp. 40-43, September-October, 2001. (By invitation)
5. **"Chemical Engineering in Cuba"** L. Zumalacarregui, C. Menendez, M. Alvarez Cuenca, *Canadian Chemical News*, pp. 27-28, September, 1998. (By Invitation)
6. **"Biotechnology Spain-Canada: A Comparative Evaluation of Business Opportunities"** Report by M. Alvarez Cuenca, Contract with the Ministry of International Trade, Government of Canada (1992).
7. **"La Potencia Industrial en Manos del I+D"** by M. Alvarez Cuenca. *El Nuevo Lunes*, Madrid, January 18, 1988. (By Invitation)