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Luís Marcelo Tavares

PERSONAL DETAILS

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BIRTH

Santo Antônio da Patrulha, RS, Brazil
November 14th, 1966

AREAS OF EXPERTISE

Comminution fundamentals and practice,
physical concentration methods, production of
ultrafine powders and alloys by grinding.

HIGHER LEVEL EDUCATION

Ph.D. Metallurgical and Materials Engineering - 1997

University of Utah - Salt Lake City - UT - USA

Thesis title: "Microscale Investigation of Particle Breakage Applied to the Study of Thermal and Mechanical Predamage"

Advisor: R.P. King

M.S. Metallurgical and Materials Engineering - 1991

Universidade Federal do Rio Grande do Sul - Porto Alegre - RS - Brazil

Thesis title: "Modeling and Simulation of Gravity Coal Processing"

Advisor: J. Rubio

B.S. Mining Engineering - 1988

Universidade Federal do Rio Grande do Sul - Porto Alegre - RS - Brazil

POSITIONS HELD

Universidade Federal do Rio de Janeiro – Department of Metallurgical and Materials Eng.

- Chairman (November/2009 – December/2011)
- Deputy-Chairman (August/2007 – October/2009)

- Associate Professor (June/1998 – present)
- Head of the Laboratory of Mineral Processing (june/1998 – present)
University of Utah - Department of Metallurgical Engineering
- Teaching assistant (April - June/1994): Process Engineering Statistics
- Research associate (April/1991 - April/1997): Utah Comminution Centre
Universidade Federal do Rio Grande do Sul – Department of Mining Engineering
- Research assistant (March/1989 - March/1991)
- Teaching assistant (July - December/1990): Mineral Processing I and III

Peer-Reviewed Journal Publications

1. TAVARES, L.M., CARVALHO, R.M.; Modeling ore degradation during handling using continuum damage mechanics. International Journal of Mineral Processing, v. 101, p. 21-27, 2012.
2. CORDEIRO, G.C., TOLEDO FILHO, R.D., TAVARES, L.M., FAIRBAIRN, E.M.R.; Experimental characterization of binary and ternary blended-cement concretes containing ultrafine residual rice husk and sugar cane bagasse ashes. Construction and Building Materials, v. 29, p. 641-646, 2012.
3. TAVARES, L.M., CARVALHO, R.M., GUERRERO, J.C.; Simulating the Bond rod mill grindability test. Minerals Engineering, v. 26, p. 99-101, 2012.
4. MARINS, S.S.; OGASAWARA, T.; TAVARES, L.M.; Synthesis of manganese zinc ferrite by powder mixing using ferric oxide from a steel mill acid recovery unit. Journal of Materials Science, v. 46, p. 1640-1645, 2011.
5. BARRIOS, G.K.P.; CARVALHO, R.M. de; TAVARES, L.M.; Extending breakage characterisation to fine sizes by impact on particle beds. Transactions -
- Institution of Mining and Metallurgy. Section C. Mineral Processing & Extractive Metallurgy, v. 120, p. 37-44, 2011.
6. CORDEIRO, G.C.; TOLEDO FILHO, R.D.; TAVARES, L.M.; FAIRBAIRN, E.M.R.; HEMPEL, S.; Influence of particle size and specific surface area on the pozzolanic activity of residual rice husk ash. Cement & Concrete Composites, v. 33, p. 529-534, 2011.
7. BARRIOS, G.K.P.; CARVALHO, R.M. de, TAVARES, L.M.; Modeling breakage of monodispersed particles in unconfined beds. Minerals Engineering, v. 24, p. 308-318, 2011.
8. GAIDZINSKI, R.; DUA LIBI Fh., J.; TAVARES, L.M.; Influence of aging on the technological properties of clays in the ceramic industry. Applied Clay Science, v. 54, p. 47-52, 2011.
9. GAIDZINSKI, R.; OSTERREICHER, P.; DUA LIBI FILHO, J.; TAVARES, L.M.; Modification of clay properties by aging: role of indigenous microbiota and implications on ceramic processing. Applied Clay Science, v. 43, p. 98-102, 2009.
10. TAVARES, L.M.; Analysis of particle fracture by repeated impacts as damage accumulation. Powder Technology, v. 190, p. 327-339, 2009.
11. GONÇALVES, J.P.; TAVARES, L.M.; TOLEDO FILHO, R.D.; FAIRBAIRN, E.M.R.; Performance evaluation of cement mortars modified with metakaolin or ground brick. Construction and Building Materials, v. 23, p. 1971-1979, 2009.
12. TAVARES, L.M.; CARVALHO, R.M.; Modeling breakage rates of coarse particles in ball mills, Minerals Engineering, v. 22, p. 650-659, 2009.
13. TAVARES, L.M.; CERQUEIRA, M.C.; IESS, J.J.; Analysis of the grinding behavior of various Portland cement clinkers, Zement-Kalk-Gips International, v. 62, pp. 95-104, 2009.

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14. CORDEIRO, G.C.; TOLEDO FILHO, R.D.; FAIRBAIRN, E.; TAVARES, L.M.; Ultrafine grinding of sugarcane bagasse ash for application as pozzolanic admixture in concrete, *Cement and Concrete Research*, v. 39, p. 110-115, 2009.
15. CARVALHO, R.M.; TAVARES, L.M.; Dynamic modeling of comminution using a general microscale breakage model, *Computer-Aided Chemical Engineering*, v. 27, p. 519-524, 2009.
16. LOUREIRO, S.A.; FRUCHARD, D.; RIVOIRARD, S.; SANTOS, D.S.; TAVARES, L. M. Synthesis, hydrogenation and mechanical milling of pseudo-binary $Zr(NbxV1-x)2$ ($0 < x < 0.65$) alloys. *Materials Science Forum*, v. 570, p. 45-51, 2008.
17. LOUREIRO, S.A.; FRUCHARD, D.; RIVOIRARD, S.; SANTOS, D.S.; TAVARES, L. M. Mechanical alloying of Zr-Nb5%at. powders: microstructural evolution and hydrogenation properties. *Materials Science Forum*, v. 570, p. 59-64, 2008.
18. TAVARES, L.M. ; NEVES, P.B.. Microstructure of quarry rocks and relationships to particle breakage and crushing. *International Journal of Mineral Processing*, v. 87, p. 28-41, 2008.
19. CORDEIRO, G.C.; TOLÊDO FILHO, R.D.; TAVARES, L.M.; FAIRBAIRN, E.M.R.; Pozzolanic activity and filler effect of sugar cane bagasse ash in Portland cement and lime mortars. *Cement & Concrete Composites*, v. 30, p. 410-418, 2008.
20. TAVARES, L.M.; CARVALHO, R.M. Impact work index prediction from continuum damage model of particle fracture. *Minerals Engineering*, v. 20, pp. 1368-1375, 2007.
21. GONÇALVES, J.; TAVARES, L. M.; TOLÊDO FILHO, R.D.; FAIRBAIRN, E.M.R.; CUNHA, E.R. Comparison of natural and manufactured fine aggregates in cement mortars. *Cement and Concrete Research*, v. 37, p. 924-932, 2007.
22. TAVARES, L. M.; CUNHA, E.R.; ALMEIDA, S.L. Influência de variáveis operacionais no desempenho de classificador dinâmico. *Revista da Escola de Minas*, v. 60, p. 1-7, 2007.
23. LOUREIRO, S.A.; TAVARES, L.M.; SALUSTIANO, A.Z.; SANTOS, D.S. Macroscale and microscale evolutions of mechanically alloyed Fe-Zn systems. *Journal of Physics and Chemistry of Solids*, v. 68, p. 1845-1855, 2007.
24. OGASAWARA, T.; TAVARES, L.M.; MARINS, S.S. Thermodynamic interpretation of manganese-zinc ferrite synthesis by calcination of a powder mixture. *Materials Letters*, v. 61, p. 5063-5066, 2007.
25. DUTRA, A.J.B.; PAIVA, P.R.P.; TAVARES, L.M. Alkaline leaching of zinc from electric arc furnace steel dust. *Minerals Engineering*, v. 19, n. 5, p. 478-485, 2006.
26. TAVARES, L.M.; CERQUEIRA, M.C. Statistical analysis of impact-fracture characteristics of industrial Portland cement clinkers. *Cement and Concrete Research*, v. 36, p. 409-415, 2006.
27. TAVARES, L.M.; LIMA, A.S. Célula de carga de impacto na caracterização de materiais para a cominuição. Parte 1: Calibração. Rem: *Revista Escola de Minas*, Ouro Preto, v. 59, n. 1, p. 61-69, 2006 (in Portuguese).
28. TAVARES, L.M.; LIMA, A.S. Célula de carga de impacto na caracterização de materiais para a cominuição. Parte 2: Fratura de partículas. Rem: *Revista Escola de Minas*, Ouro Preto, v. 59, n. 2, p. 165-172, 2006 (in Portuguese).
29. CARNEIRO NETTO, B.P.; TAVARES, L.M. Produção de agregado graúdo para a construção civil. Parte 1: Uma nova concepção de lavra. *Areia & Brita*, São Paulo, v. 34, n. jun, p. 8-14, 2006 (in Portuguese).
30. CARNEIRO NETTO, B.P.; TAVARES, L.. M. Produção de agregado

- graúdo para a construção civil. Parte 2: Novos conceitos no projeto de usinas de beneficiamento. Areia & Brita, São Paulo, v. 35, p. 20-27, 2006 (in Portuguese).
31. GONÇALVES, J.; TOLÊDO FILHO, R.D.; FAIRBAIRN, E.M.R.; TAVARES, L. M. Utilização de areia industrial para produção de concretos. TECBAHIA, v. 21, p. 74-88, 2006 (in Portuguese).
32. TAVARES, L.M.; KING, R.P. Continuum damage modeling of particle fracture. ZKG International, Gütersloh, v. 58, n. 1, p. 49-58, 2005.
33. TAVARES, L.M. Particle weakening in high-pressure roll grinding. Minerals Engineering, v. 18, p. 651-657, 2005.
34. GAIDZINSKI, R.; DUAILIBI FILHO, J.; TAVARES, L.M. Sazonamento e homogeneização de argilas em pilhas. Cerâmica Industrial, São Carlos, v. 10, n. 5/6, p. 19-22, 2005 (in Portuguese).
35. TAVARES, L.M.; KING, R.P. Modeling of the load-deformation response from impact-breakage of particles. International Journal of Mineral Processing, v. 74, n. 1001, p. S267-S277, 2004.
36. TAVARES, L.M. Optimum routes for particle breakage by impact. Powder Technology, v. 142, n. 2-3, p. 81-91, 2004.
37. NEVES, P.B.; TAVARES, L.M. Racionalização do consumo de energia na britagem com auxílio de simulação computacional. Tecnologia em Metalurgia e Materiais (São Paulo), São Paulo, v. 1, n. 2, p. 53-58, 2004 (in Portuguese).
38. TAVARES, L.M.; KING, R.P. Modeling of particle fracture by repeated impacts using continuum damage mechanics. Powder Technology, v. 123, n. 2-3, p. 138-146, 2002.
39. TAVARES, L.M.; SOUZA, L.L.G.; POSSA, M.V.; LIMA, J.R.B. Modeling classification in small-diameter hydrocyclones under variable rheological conditions. Minerals Engineering, v. 15, p. 613-622, 2002.
40. TAVARES, L.M.; CAFFARENA, V.R.; SANTOS, J.G.; CABRAL, A.J.O.; OGASAWARA, T. The contribution of ultra-fine milling for the microstructure and density of the doped barium hexaferrite sintered discs. Acta Microscópica, v. 11, p. 13-16, 2002.
41. SOUZA, V.C.G.; TAVARES, L.M.; SAMPAIO, C.H. Estudo por microscopia ótica e lupa das características mineralógicas e microestruturais do clínquer aplicado ao processo de moagem e qualidade do cimento. Revista da Escola de Minas, v. 52, n. 2, p. 125-129, 2002 (in Portuguese).
42. SOUZA, V.C.G.; SAMPAIO, C.H.; TAVARES, L.M. Estudo da influência da microestrutura do clínquer sobre a moagem na fabricação de cimento: microscopia eletrônica de varredura. Revista da Escola de Minas, Ouro Preto, v. 55, n. 3, p. 209-213, 2002 (in Portuguese).
43. TAVARES, L.M. Um novo método para o Cálculo da Eficiência Energética de Moinhos Industriais. Matéria (UFRJ), Rio de Janeiro, v. 6, n. 1, 2001 (in Portuguese).
44. TAVARES, L.M.; CABRAL, A.J.O.; OGASAWARA, T. Preparação de óxido de ferro sub-micrométrico para aplicação em cerâmicas magnéticas por moagem de alta energia. Revista Matéria, Rio de Janeiro, v. 6, n. 1, p. 1-7, 2001 (in Portuguese).
45. TAVARES, L.M.; KING, R.P. Evaluation of Thermally-Assisted Fracture of Particles using Microscale Fracture Measurements. Kona (Osaka), Japan, v. 17, n. 1, p. 163-172, 2000.
46. TAVARES, L.M. Energy Absorbed in Breakage of Single Particles in Drop Weight Testing. Minerals Engineering, Oxford, v. 12, n. 1, p. 43-50, 1999.
47. TAVARES, L.M. Monte Carlo Simulations on the Potential Energy Theory of Jigging. Coal Preparation (New York), v. 20, p. 71-83, 1999.

48. TAVARES, L.M.; KING, R.P. Single-Particle Fracture Under Impact Loading. *International Journal of Mineral Processing*, Holand, v. 54, n. 1, p. 1-28, 1998.
49. POCOCK, J.; VEASEY, T.J.; TAVARES, L.M.; KING, R.P. The Effect of Heating and Quenching of Quartzite on Grinding Characteristics. *Powder Technology*, v. 95, p. 137-142, 1998.
50. TAVARES, L.M.; KING, R.P. A Useful Model for the Calculation of the Performance of Batch and Continuous Jigs. *Coal Preparation* (New York), Malasia, v. 15, n. 3-4, p. 99-128, 1995.

Books and Book Chapters Published

1. SAMPAIO, C.H.; TAVARES, L.M. *Beneficiamento Gravimétrico: Uma introdução aos processos de concentração mineral e reciclagem de materiais por densidade*. 1. ed. Porto Alegre: Editora da UFRGS, 2005. v. 1. 603 p. (in Portuguese).
2. TAVARES, L.M.; SILVEIRA, M.A.C.W.; Comparison of measures of rock crushability. In: Meftuni Yekeler. (Org.). *Fine Particle Technology and Characterization*. Kerala: Research Signpost, 2008, p. 1-20.
3. TAVARES, L.M. Breakage of particles: Quasi-Static. In: Agba D. Salman; Michael J. Hounslow; Mojtaba Ghadiri. (Org.). *Handbook of Powder Technology: Particle Breakage*. 1 ed. Amsterdam: Elsevier B.V., 2007, v. 12, p. 3-68.
4. TAVARES, L.M.; AUSTIN, L.G.; KING, R.P. Breakage and Damage of Particles by Impact. In: S.K. Kawatra. (Org.). *Advances in Comminution*. Littleton, Colorado: SME, 2006, p. 205-220.
5. TAVARES, L.M.; RUBIO, J. Performance Evaluation and Simulation of a Batac Jig Cleaning Pyrite from Coal Washery Tailings. In: R. P. Dugan; D. R. Quigley; Y.A. Attia. (Org.). *Processing and Utilization of*

High-Sulfur Coals IV. 1 ed. Amsterdam: Elsevier Science, 1991, v. 1, p. 597-608.

6. TAVARES, L.M.; SAMPAIO, C.H. Evaluation of Spirals in Cleaning Fines of a High Sulfur Brazilian Coal. In: R. Markuszewski; T.D. Wheelock. (Org.). *Processing and Utilization of High-Sulfur Coals III*. 1 ed. Amsterdam: Elsevier Science, 1990, v. 1, p. 301-310.

Editorial Board Membership of Journals

- Editorial Board Member of REM: *Revista da Escola de Minas* (Brazil)
- Editorial Board Member of The Open Journal of Construction & Building Technology Journal (Bentham Open)
- Ad Hoc reviewer of over 15 journals

Other

- Member of the Brazilian Association of Metallurgy, Materials and Mining (ABM)
- Member of the Society of Mining, Metallurgy & Exploration (SME)
- Principal Investigator of over 80 R&D and consulting projects
- 78 complete publications in conference proceedings
- 365 citations in SCOPUS; h-index (Scopus): 10
- Research provider and representative from UFRJ in AMIRA's P9 project "Optimization of mineral processing through modeling and simulation" (2008-2015)
- Member of the Global Comminution Collaborative, which congregates researchers from UFRJ, JKMR, Hacettepe University, Chalmers University and UCT.