

Brian R. Strazisar
PRINCIPAL INVESTIGATOR

Affiliation RJ Lee Group, Inc.
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Monroeville, PA 15146

Education
Ph.D. Physical Chemistry, Cornell University, 2000
B.S. Chemistry, University of Pittsburgh, 1995

Employment History
2014-Present RJ Lee Group, Inc., Principal Investigator
2001 – 2014 National Energy Technology Laboratory, Pittsburgh, Pa., Principal Investigator
2000 – 2001 National Research Council (NETL), Pittsburgh, Pa., Post-Doctoral Fellow

Summary

- » Conducted detailed studies on deep wellbore cement chemistry, physical properties, and corrosion/failure mechanisms for CO₂ storage and shale gas production.
- » Contributed to projects related to concrete service lifetime estimation, forensic failure analysis of concrete, soil stabilization, and concrete/mortar characterization.
- » Served as technical lead over a diverse research portfolio related to geologic and environmental systems relevant to energy production.
- » Quantitative risk assessment for wellbore cement failure.
- » Soil-gas monitoring, analysis, and methods development for environmental applications.
- » Geochemistry of fluid/rock (or cement) interactions affecting flow properties relevant to oil and gas industry.
- » Extensive training on communication of science to technical and non-technical audiences including news media, community leaders, and the general public.

Honors, Awards, Fellowships & Memberships

- » 2009 R&D 100 Award
- » 2009 Hugh Guthrie Award for Innovation
- » 2000-2001 NRC postdoctoral fellowship
- » 1996-2000 Eastman Kodak graduate fellowship
- » 2012-present National Academies Science Ambassador
- » 2005-present Member, American Geophysical Union
- » 2002-present Member, American Chemical Society

Additional Training

- » 2014 - The Craft of Scientific Presentations
- » 2013 - Media Communications Training
- » 2003 - Deep Drilling Technology
- » 2003 - Coal and Power Training
- » 2002 - Geochemist's Workbench Training
- » 2002 - Tough 2 (numerical geotransport model) Training
- » 2002 - Geochemical Modeling (full semester course)

Journal Publications

Huerta, N.J., M.A. Hesse, S.L. Bryant, **B.R. Strazisar**, and C.L. Lopano, "Reactive transport of CO₂-saturated water in a cement fracture: Application to wellbore leakage during geologic CO₂ storage." *International Journal of Greenhouse Gas Control*, 2015 *in press*.

Huerta, N.J., **B.R. Strazisar**, S.L. Bryant, and M.A. Hesse. "Time-dependent Fluid Migration From a Storage Formation via Leaky Wells." *Energy Procedia* 63, 5724-5736, 2014.

Zhang, L., D.A. Dzombak, D.V. Nakles, S.B. Hawthorne, D.J. Miller, B.G. Kutchko, C.L. Lopano, and **B.R. Strazisar**. "Rate of H₂S and CO₂ attack on pozzolan-amended Class H well cement under geologic sequestration conditions." *International Journal of Greenhouse Gas Control* 27, 299-308, 2014.

Zhang, L., D.A. Dzombak, D.V. Nakles, S.B. Hawthorne, D.J. Miller, B. Kutchko, C. Lopano, and **B. Strazisar**. "Effect of exposure environment on the interactions between acid gas (H₂S and CO₂) and pozzolan-amended wellbore cement under acid gas co-sequestration conditions." 27, 309-318, 2014.

Goodman, A., G. Bromhal, **B. Strazisar**, T. Rodosta, W. Guthrie, D. Allen, G. Guthrie, "Comparison of methods for geologic storage of carbon dioxide in saline formations." *Int. J. of Greenhouse Gas Control* 18, 329-342, 2013.

Wells, A., J.R. Diehl, **B. Strazisar et al.**, "Atmospheric and soil-gas monitoring for surface leakage at the San Juan Basin CO₂ pilot test site at Pump Canyon New Mexico, using perfluorocarbon tracers, CO₂ soil-gas flux and soil-gas hydrocarbons" *Int. J. of Greenhouse Gas Control* 14, 227-238, 2013.

Zhang, L., D.A. Dzombak, D.V. Nakles, S.B. Hawthorne, D.J. Miller, B.G. Kutchko, C.L. Lopano, and **B.R. Strazisar**. "Characterization of pozzolan-amended wellbore cement exposed to CO₂ and H₂S gas mixtures under geologic carbon storage conditions." *International Journal of Greenhouse Gas Control* 19, 358-368, 2013.

Brunet, J.L., L. Li, Z.T. Karpyn, B.G. Kutchko, **B. Strazisar**, and G. Bromhal, "Dynamic Evolution of Cement Composition and Transport Properties under Conditions Relevant to Geological Carbon Sequestration," *Energy & Fuels* 27(8), 4208-4220, 2013.

Huerta, N.J., M.A. Hesse, S.L. Bryant, **B.R. Strazisar**, and C.L. Lopano, "Experimental Evidence for Self-Limiting Reactive Flow through a Fractured Cement Core: Implications for Time-Dependent Wellbore Leakage," *Environ. Sci. Technol.* 47 (1), 269–275, 2013.

Huerta, N.J., Q.C. Wenning, M.A. Hesse, S.L. Bryant, C.L. Lopano, and **B.R. Strazisar**. "Development of reacted channel during flow of CO₂ rich water along a cement fracture." *Energy Procedia* 37, 5692-5701, 2013.

Siriwardane, H.J., B.D. Bowes, G.S. Bromhal, R.K. Gondle, A.W. Wells, **B.R. Strazisar**, "Modeling of CBM Production, CO₂ Injection, and Tracer Movement at a Field CO₂ Sequestration Site," *International Journal of Coal Geology* 96, 120-136, 2012.

Yang, Y.-M., M.J. Small, E.O. Ogretim, D.D. Gray, A.W. Wells, G.S. Bromhal, **B.R. Strazisar**, "A Bayesian Belief Network (BBN) for Combining Evidence from Multiple CO₂ Leak Detection Technologies," *Greenhouse Gases: Science and Technology* 2(3), 185–199, 2012.

Yang, Y.-M., M.J. Small, B. Junker, G.S. Bromhal, **B. Strazisar**, A. Wells, "Bayesian Hierarchical Models for Soil CO₂ Flux and Leak Detection at Geologic Sequestration Sites," *Environmental Earth Sciences* 64(3), 787-798, 2011.

Yang, Y.-M., M.J. Small, J. Mitchell, E.O. Ogretim, D.D. Gray, G.S. Bromhal, **B.R. Strazisar**, and A.W. Wells, "Probabilistic Design of a Near-Surface CO₂ Leak Detection System," *Environmental Science & Technology* 45(15), 6380-6387, 2011.

Kutchko, B.G., **B.R. Strazisar**, S.B. Hawthorne, et al. "H₂S-CO₂ Reaction with Hydrated Class H Well Cement: Acid-Gas Injection and CO₂ Co-Sequestration," *International Journal of Greenhouse Gas Control* 5(4), 880-888, 2011.

Hawthorne, S.B., D.J. Miller, Y. Holubnyak, J.A. Harju, B.G. Kutchko, and **B.R. Strazisar**, "Experimental Investigations of the Effects of Acid Gas (H₂S/CO₂) Exposure under Geological Sequestration Conditions," *Energy Procedia* 4, 5259-5266, 2011.

Huerta, N.J., S.L. Bryant, **B.R. Strazisar**, et al., "Dynamic Alteration along a Fractured Cement/Cement Interface: Implications for Long-Term Leakage Risk along a Well with an Annulus Defect," *Energy Procedia* 4, 5398-5405, 2011.

Spangler, L. H., L. H. Dobeck, K. S. Repasky et al., "A Shallow Subsurface Controlled Release Facility in Bozeman, Montana, USA, for Testing Near-Surface CO₂ Detection Techniques and Transport Models," *Environmental Earth Sciences* 60(2), 227-239, 2010.

Wells, A., **B. Strazisar**, J. R. Diehl, "Atmospheric Tracer Monitoring and Surface Plume Development at the ZERT Pilot Test in Bozeman, Montana, USA," *Environmental Earth Sciences* 60(2), 299-305, 2010.

Strazisar, B., B. Kutchko, N. Huerta, "Chemical Reactions of Wellbore Cement Under CO₂ Storage Conditions: Effects of Cement Additives," *Energy Procedia*, 1(1), 3603-3607, 2009.

Huerta, N. J., S. L. Bryant, **B. R. Strazisar**, B. G. Kutchko, L. C. Conrad, "The Influence of Confining Stress and Chemical Alteration on Conductive Pathways within Wellbore Cement," *Energy Procedia*, 1(1), 3571-3578, 2009.

Spangler, L. H., L. M. Dobeck, K. Repasky, A. Nehrir, S. Humphries, J. Barr, C. Keith, J. Shaw, J. Rouse, A. Cunningham, S. Benson, C. M. Oldenburg, J. L. Lewicki, A. Wells, R. Diehl, **B. Strazisar**, J. Fessenden, T. Rahn, J. Amonette, J. Barr, et al., "A Controlled Field Pilot for Testing Near-Surface CO₂ Detection Techniques and Transport Models," *Energy Procedia*, 1(1), 2143-2150, 2009.

Strazisar, B. R., A.W. Wells, J. R. Diehl, et al., "Near-Surface Monitoring for the ZERT Shallow CO₂ Injection Project," *International Journal of Greenhouse Gas Control* 3(6), 736-744, 2009.

Kutchko, B. G., **B.R. Strazisar**, N. Huerta, et al., "CO₂ Reaction with Hydrated Class H Well Cement under Geologic Sequestration Conditions: Effects of Flyash Admixtures," *Environmental Science & Technology* 43(10), 3947-3952, 2009.

Kutchko, B. G., **B.R. Strazisar**, G. V. Lowry et al., "Rate of CO₂ Attack on Hydrated Class H Well Cement under Geologic Sequestration Conditions," *Environmental Science & Technology* 42(16), 6237-6242, 2008.

Kutchko, B. G., **B.R. Strazisar**, D.A. Dzombak et al., "Degradation of Well Cement by CO₂ under Geologic Sequestration Conditions," *Environmental Science & Technology* 41(13), 4787-4792, 2007.

Wells, A. W., J. R. Diehl, G. Bromhal, **B. R. Strazisar**, T. H. Wilson, C. M. White, "The Use of Tracers to Assess Leakage from the Sequestration of CO₂ in a Depleted Oil Reservoir, New Mexico, USA," *Applied Geochemistry* 22, 996-1016, 2007.

Wells, A. W., M. Nowak, J. R. Diehl, **B. Strazisar**, R. Hammick, G. Veloski, P. Hamill, "NETL Monitors CO₂ Storage," *Clean Coal Today*, No. 71, 2007.

Wells, A. W., R. W. Hammack, G. A. Veloski, J. R. Diehl, **B. R. Strazisar**, T. H. Wilson, H. Rauch, C. M. White, "Monitoring, Mitigation and Verification at Sequestration Sites: SEQURE Technologies and the Challenge for Geophysical Detection," *The Leading Edge*, October 2006, 1264-1270, 2006.

Allen, D. E., **B.R. Strazisar**, Y. Soong et al., "Modeling Carbon Dioxide Sequestration in Saline Aquifers: Significance of Elevated Pressures and Salinities," *Fuel Processing Technology* 86, (14-15), 1569- 1580, 2005.

Strazisar, B. R., R. R. Anderson, C. M. White, "Degradation Pathways for Monoethanolamine in a CO₂ Capture Facility," *Energy & Fuels*, vol 17, 1034-1039, 2003.

White, C. M., **B. R. Strazisar**, E. J. Granite, J. S. Hoffman, H. W. Pennline, "Separation and Capture of CO₂ from Large Stationary Sources and Sequestration in Geological Formations – Coalbeds and Deep Saline Aquifers," *Journal of Air & Waste Manage. Assoc.* 53, 645-715, 2003.

Anderson, R. R., D. V. Martello, P. C. Rohar, **B. R. Strazisar**, J. P. Tamilia, K. Waldner, C. M. White, W. K. Modey, N. F. Mangelson, D. J. Eatough, "Sources and Composition of PM_{2.5} at the National Energy Technology Laboratory in Pittsburgh during July and August 2000," *Energy & Fuels* 16, 261-269, 2002.

Strazisar, B. R., C. Lin, H. F. Davis, "Vibrationally Inelastic Scattering of High-n Rydberg H Atoms from N₂ and O₂," *Physical Review Letters* 86, 3997-4000, 2001.

Strazisar, B. R., C. Lin, H. F. Davis, "Mode Specific Energy Disposal in the 4-Atom Reaction OH + D₂ → HOD + D," *Science* 290, 958-961, 2000.

Bernard, E. J., **B. R. Strazisar**, H. F. Davis, "Excited State Dynamics of H₂CN Radicals," *Chem. Phys. Lett.* 313, 461-466, 1999.

Balabai, N., A. Sukharevsky, I. Read, **B. Strazisar**, M. Kurnikova, R.S. Hartman, R.D. Coalson, D.H. Waldeck, "Rotational diffusion of organic solutes: The role of dielectric friction in polar solvents and electrolyte solutions" *J. Mol. Liq.* 77, 37-60, 1998.