

Curriculum vitae

Lothenbach, Barbara Elisabeth

Head Thermodynamic Modelling Group
Laboratory Concrete/Construction Chemistry
Empa, Überlandstr. 129
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Professor II, Concrete Group,
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Professional experience

- 2017 to date Professor II, International Chair at the Concrete Group, Department of Structural Engineering, NTNU Trondheim, Norway.
- 2002 to date Laboratory Concrete and Construction Chemistry, Empa Dübendorf, Switzerland;
Distinguished Senior Scientist / Head Thermodynamic Modelling Group
Topics: thermodynamic modelling, hydration of cements, pore solutions, alternative cements, thermogravimetric analysis
- 2009 4 months sabbatical at NIST, USA
- 1996 - 2002 Project leader and consultant scientist for nuclear wastes at BMG Engineering Ltd, Schlieren, Switzerland:
transport and retention of heavy metals and radionuclides in bentonite and cementitious liners, database development, waste management, representation of Switzerland 2000-2002 in UN's PRTR working group.
- 1993 - 1996 PhD student and research assistant at the Institute of Terrestrial Ecology, Soil Protection, Swiss Federal Institute of Technology (ETH) Zürich, Switzerland:
heavy metal sorption on clay minerals; aluminium-modified clay minerals; remediation of contaminated soils.
- 1990 - 1991 Research assistant for conservation and environmental management projects at the University of Tasmania, Australia and at the Department of Parks, Wildlife and Heritage, Hobart, Tasmania, Australia:
Protection of endemic plants and environmental management systems.
- 1987 - 1988 Consultant for noise prevention at BMP Dr. Pelli + Co., Zürich, Switzerland.

Education

- 1993-1996 PhD at the Laboratory of Soil Science, ETH Zürich, Switzerland: "Gentle soil remediation: immobilisation of heavy metals by aluminum and montmorillonite compounds"
- 1987-1992 Study of Environmental Science at ETH Zürich; focus area: inorganic chemistry and soil science; diploma in Environmental Science 1992.
- 1986-1987 Study of Biology at ETH Zürich: Pre-Diploma in Biology, 1987.

Main research interests

Geochemical modelling and thermodynamic databases

Mechanisms of ion binding on C-S-H and other solids
Cement interaction with the environment (sulphate attack, rocks, ...)
Kinetic: influence of dissolved ions, composition of solids

Main areas of experience

Thermodynamic modelling
Solid/water interactions
Hydration of cements (Portland cements, low pH cements, calcium sulfoaluminate cements, ...)
Interaction of cementitious materials with superplasticizers and ions
Transport and retention of metals in bentonite and cementitious liners
Characterisation of solid (XRD, TGA, NMR) and liquid (IC, ICP-OES) phases
Database development
Waste management
Environmental fate of heavy metal and pollutants

Honors and awards:

2016: promoted Distinguished Senior Researcher” by Empa in recognition of outstanding research, the title has been awarded only four times so far
2016: Materials and Structures outstanding papers award for: *The pore solution of blended cements: a review by A. Vollpracht, B. Lothenbach, R. Snellings, J. Haufe*

Membership in national and international committees

Coordinator since 2002 of “CEMNET”: A joining of Swiss researchers in the field of cement and concrete. www.empa.ch/cemnet; organisation of regular meetings and international workshops.

Member in the European research network “Nanocem”.

Member of the editorial board of Cement & Concrete Research (since 2009), Advances in Cement Research (since 2014), Materiales de Construcción (since 2014) and npj Materials Degradation (since 2018).

Member of RILEM and RILEM Technical Committees

International conferences/workshops (co-)organised

2018 Hydration and microstructure characterization of cementitious materials, NTNU Norway
2018 Calcium sulfoaluminate cements, Murten, Switzerland
2018 Calcium silicate hydrates containing aluminium: C-A-S-H, Dübendorf, Switzerland
2016 Mechanisms and modelling of waste/cement interactions 4, Murten, Switzerland
2015 Pre congress course Cement Hydration, Beijing Univ Technology, China
2015 Pre congress course Microstructural Characterization, Tsinghua Univ, Beijing, China
2014 Calcium silicate hydrates containing aluminium: C-A-S-H, Dübendorf, Switzerland
2014 Meeting of RILEM TC SCM, Dübendorf, Switzerland

- 2013 Mechanisms and modelling of waste/cement interactions 3, Ghent, Belgium
- 2012 GDCh Jahrestagung, Dübendorf, Switzerland
- 2011 Blended and alternative cements, Dübendorf, Switzerland
- 2008 Mechanisms and modelling of waste/cement interactions 2, Le Croisic, France
- 2007 Cement research at large facilities, PSI Villigen, Switzerland
- 2006 Cement-organic interaction, Dübendorf, Switzerland
- 2005 Mechanisms and modelling of waste/cement interactions, Meiringen, Switzerland
- 2003 Porosity of cementitious materials, Dübendorf, Switzerland

Teaching experience

Doctoral courses, lectures at master and doctoral level at Empa, EPFL, ETHZ, University of Bern, NTNU

Teaching and organisation of international workshops on thermodynamic modelling:

- 2019 6th GEMS workshop + NTNU doctoral course, Dübendorf, Switzerland
- 2017 5th GEMS workshop, Dübendorf, Switzerland
- 2014 4th GEMS workshop, Dübendorf, Switzerland
- 2012 Thermodynamic Modelling in Cementitious Systems, Sao Paulo, Brasil
- 2010 3rd GEMS workshop, Dübendorf, Switzerland
- 2008 2nd GEMS workshop, Dübendorf, Switzerland
- 2007 Thermodynamics workshop, Dübendorf, Switzerland

Invited lectures (since 2011)

- 16.-20.9.2019: Prague, Czech Republic: Lothenbach, B., Zajac, M.: *Application of thermodynamic modelling to hydrated cements*. 15th International Congress on the Chemistry of Cement (ICCC 2019).
- 27.6.2019: Paris, France: Lothenbach, B.: *Effect of carbonation on hydrate assemblage and pore solution*. Workshop on concrete carbonation: from fundamental aspects to field assessments.
- 24.-26.6.2019: London, Great Britain: Lothenbach, B., Winnefeld, F.: *Hydrates in blended and non-Portland cements*. 1st International Conference on Innovation in Low-Carbon Cement and Concrete technology (ILCCC)
- 12.-14.9.2018: Weimar, Germany: Lothenbach B., Bernard, E., L'Hôpital, E.: *Calcium silicate hydrates and magnesium silicate hydrates*, 20. Internationale Baustofftagung (ibausil)
- 26.-29.8.2018: Delft, Netherlands: Lothenbach B., Winnefeld F.: *Thermodynamic modelling: a tool to understand the chemistry of hydrated cements*. RILEM Week 2018, CONMOD.
- 10.-15.9.2017: Barcelona, Spain: Lothenbach B.: *Chemistry of cements*. Migration 2017.
- 17.-18.5.2017 Les Diablerets, Switzerland: Lothenbach, B., Kulik, D.: *Aluminium in C-S-H: experimental evidence and thermodynamic modelling*. International Workshop on Atomistic Simulations for Cementitious Materials.

- 2.-6.4.2017: San Francisco, USA: Lothenbach B: *Calcium silicate hydrates*. 253rd American Chemical Society National Meeting.
- 25.-26.10.2016: Heidelberg, Germany: Lothenbach, B.: *Zementhydratation*. Workshop des Verbundprojekts „Geochemische Radionuklidrückhaltung an Zementalterationsphasen“ (GRaZ), Universität Heidelberg.
- 6.4.2016: Salzburg, Austria: Lothenbach, B.: *Thermodynamic modelling of cements*. Seminarreihe Materialforschung & Physik, Universität Salzburg
- 13.-16.10.2015: Beijing, China: Lothenbach, B., Nonat, A.: *Calcium silicate hydrates: solid and liquid phase composition*. 14th International Congress on the Chemistry of Cement
- 12.10.2015: Beijing, China: B. Lothenbach: *Nature of hydrates: C-S-H; Thermodynamic predictions of hydrate assemblages*. Precongress Course Hydration of Cement, Beijing University of Technology
- 11.10.2015: Beijing, China: B. Lothenbach: *Thermogravimetric analysis; Ternary diagrams and thermodynamic modelling of hydrate assemblages*. Precongress Course Microstructural Characterisation, Tsinghua University,
- 16.9.2015: Weimar, Germany: *Influence of slag composition on hydrate composition and compressive strength*, 19. Internationale Baustofftagung (ibautil)
- 6.10.2014: Kassel, Germany: *Thermogravimetrische Analyse (TGA) anorganischer Bindemittel: ,To does and not to does‘ of TGA*. GDCh Tagung Bauchemie; Methodik-Forum.
- 8.4.2014: Lausanne, CH: *Effects of supplementary cementitious materials on microstructure and performance of cements*. Nanocem 10th Anniversary Open Meeting.
- 2.-3.9.2013: Portsmouth, UK: *Thermodynamic modelling of cement hydration*. Cement and Concrete Science Conference.
- 25.-30.8.2013: Florence, Italy: *Thermodynamic data for cementitious systems: katoite*. Goldschmidt conference, session 23e.
- 25.-26.9.2012: Sao Paulo, Brasil: Lothenbach, B.: *Thermodynamic modelling and cement hydration of cements*. Public seminar, University of Sao Paulo
- 17.-21.9.2012: Sao Paulo, Brasil: Lothenbach, B., Winnefeld, F.: *Thermodynamic modelling*. Workshop university of Sao Paulo
- 12.-15.9.2012: Weimar, Germany: Lothenbach, B., Dilnesa, B.Z., Wieland, E.: *Fate of iron during the hydration of cements*. 18. Internationale Baustofftagung (ibautil)
- 16.-18.7.2012: Gaithersburg, MD: B. Lothenbach: *Thermodynamic modelling of cement hydration*. 23rd NIST Computer Modeling Workshop
- 27.-29.7.2011: Corvallis, OR: B. Lothenbach, W. Kunther, K. Scrivener: *Influence of different sulphate solutions*. Expansive Reactions in Cement-Based Materials
- 24.-26.7.2011: Nashville, TN: B. Lothenbach: *Thermodynamic modelling of cement hydration*. 2nd annual ACerS Cements Division/ACBM meeting
- 20.-22.7.2011: Gaithersburg, MD: B. Lothenbach: *Thermodynamic modelling of cement hydration*. 22nd NIST Computer Modeling Workshop
- 6.-7.10.2011: Hamburg, Germany: B. Lothenbach: *Thermodynamische Modellierung in der Bauchemie*. Tagung Bauchemie der GDCh Fachgruppe Bauchemie

- 3.-8.7.2011: Madrid: Lothenbach, B., Damidot, D., Herfort, D., Glasser, F.P.:
Thermodynamics and cement science. 13th International Congress on the
Chemistry of Cement
- 1.7.2011: Madrid: K. Scrivener, B. Lothenbach: *Cementitious material hydration* Precongress
Course
- 24.5.2011: Trondheim, Norway: B. Lothenbach: *Thermodynamic modelling of cement
hydration*. COIN Seminar
- 16.5.2011: Dübendorf, Switzerland: B. Lothenbach *Chemistry of blended cements* 4. Cemnet
Workshop: Blended and Alternative Cements.
- 2.5.2011: Barcelona, Spain: B. Lothenbach: *Leaching of Portland cement samples*. Workshop
on leaching of construction materials
- 11.-12.4.2011: Firenze, Italy: B. Lothenbach: *Thermodynamic modelling of cements*. 3rd
CODICE Workshop on multiscale modelling and experiments for cementitious
materials
- 5.4.2011: Düsseldorf, Germany: B. Lothenbach: *Thermodynamische Modellierung der
Zementhydratation*. vdz Fachtagung Zementchemie
- 18.2.2011: Lausanne, Switzerland: B. Lothenbach: *Thermodynamics and hydration of
blended cements*. Nanocem knowledge transfer workshop.

Papers: SCI, SCI-E (H-index scopus: 53; webofscience: 49)

1. Nedyalkova, L., Lothenbach, B., Renaudin, G., Mäder, U., Tits, J. (2019) Effect of redox conditions on the structure and solubility of sulfur- and selenium-AFm phases *Cement and Concrete Research*, 123, 105803
2. Xu, B., Winnefeld, F., Kaufmann, J., Lothenbach, B. (2019) Influence of magnesium-to-phosphate ratio and water-to-cement ratio on hydration and properties of magnesium potassium phosphate cements, *Cement and Concrete Research*, 123, 105781
3. Lothenbach, B., Zajac, M. (2019) Application of thermodynamic modelling to hydrated cements. *Cement and Concrete Research*, 123, 105779
4. Cuesta, A., De la Torre, A.G., Santacruz, I., Diaz, A., Trtik, P., Holler, M., Lothenbach, B., Aranda, M.A.G. (2019) Quantitative disentangling of amorphous phases in cement pastes by synchrotron ptychographic X-ray tomography, *IUCrJ (International Union of Crystallography Journal)*, 6, 473–491.
5. Shi, Z., Geng, G., Leemann, A., Lothenbach, B. (2019) Synthesis, characterization and water uptake property of alkali-silica reaction products, *Cement and Concrete Research*, 121, 58-71.
6. Hargis, C., Lothenbach, B., Müller, C., Winnefeld, F. (2019) Further insights into calcium sulfoaluminate cement expansion, *Advances in Cement Research*, 31, 160-177.
7. Zajac, M., Skocek, J., Bullerjahn, F., Lothenbach, B., Scrivener, K., Ben Haha, M. (2019) Early hydration of ye'elimite: insights from thermodynamic modelling. *Cement and Concrete Research*, 120, 152-169.
8. De Weerd, K., Plusquellec, G., Revert, A.B., Geiker, M.R., Lothenbach, B. (2019) Effect of carbonation on the pore solution of mortar, *Cement and Concrete Research*, 118, 38-56.
9. Bernard, E., Lothenbach, B., Chlique, C., Wyrzykowski, M., Dauzères, A., Pochard, I.,

- Cau-dit-Coumes, C. (2019) Characterisation of magnesium silicate hydrate (M-S-H), *Cement and Concrete Research*, 116, 309-330.
10. Shi, Z., Ferreira, S., Lothenbach, B., Geiker, M.R., Kunther W., Kaufmann, J., Herfort D., Skibsted, J. (2019) Sulfate resistance of limestone calcined clay cements *Cement and Concrete Research*, 116, 238-251.
 11. Lothenbach, B., Kulik, D., Matschei, T., Balonis, M., Baquerizo, L., Dilnesa, B.Z., Miron, D.G., Myers, R. (2019) Cemdata18: A chemical thermodynamic database for hydrated Portland cements and alkali-activated materials *Cement and Concrete Research*, 115, 472-506.
 12. De Weerd, K, Lothenbach, B., Geiker, M.R. Comparing chloride ingress measurements from seawater and NaCl solution (2019) *Cement and Concrete Research*, 115, 80-89.
 13. Snellings, R., Chwast, J., Cizer, O., De Belie, N., Dhandapani, Y., Durdzinski, P., Elsen, J., Haufe, J., Hooton, D., Patapy, C., Perebatova, O., Santhanam, M., Scrivener, K., Snoeck, D., Steger, L., Tongbo, S., Vollpracht, A., Winnefeld, F., Lothenbach, B. (2018) RILEM TC 238-SCM recommendation on hydration stoppage by solvent exchange for the study of hydrate assemblages, *Materials and Structures*, 51, 172.
 14. Snellings, R., Chwast, J., Cizer, O., De Belie, N., Dhandapani, Y., Durdzinski, P., Elsen, J., Haufe, J., Hooton, D., Patapy, C., Perebatova, O., Santhanam, M., Scrivener, K., Snoeck, D., Steger, L., Tongbo, S., Vollpracht, A., Winnefeld, F., Lothenbach, B. (2018) Report of TC 238-SCM: hydration stoppage methods for phase assemblage studies of blended cements – results of a round robin test, *Materials and Structures*, 51, 111.
 15. Xu, B., Lothenbach, B., Ma, H. (2018) Properties of fly ash blended magnesium potassium phosphate mortars: effect of the ratio between fly ash and magnesia, *Cement Concrete Composites* 90, 169-177
 16. Kunther, W., Lothenbach, B. (2018) Improved volume stability of mortar bars exposed to magnesium sulfate in the presence of bicarbonate ions. *Cement and Concrete Research*, 109, 217-229
 17. Vespa, M., Lothenbach, B., Dähn, R., Huthwelker, T., Wieland, E. (2018) Characterisation of magnesium silicate hydrate phases: a combined approach using synchrotron-based absorption-spectroscopy and ab initio calculations, *Cement and Concrete Research*, 109, 175-183.
 18. Xu, B., Lothenbach, B., Leemann, A., Winnefeld, F. (2018) Reaction mechanism of magnesium potassium phosphate cement with high magnesia-to-phosphate ratio, *Cement and Concrete Research*, 108, 140-151.
 19. Olsson, N., Lothenbach, B., Baroghel-Bouny, V., Nilsson, L.O. (2018) Unsaturated ion diffusion in cementitious materials – The effect of slag and silica fume, *Cement and Concrete Research*, 108, 31-37.
 20. Rojo, H., Scheinost, A.C., Lothenbach, B., Laube, A., Wieland, E., Tits J.(2018) Retention of selenium by calcium aluminate hydrate (AFm) phases under strongly-reducing radioactive waste repository conditions. *Dalton Transactions*, 47, 4209-4218.
 21. Bernard, E., Lothenbach, B., Cau-Dit-Coumes, C., Chlique, C., Dauzères, A., Pochard, I. (2018) Magnesium and calcium silicate hydrates, Part I: Investigation of the possible magnesium incorporation in calcium silicate hydrate (C-S-H) and of the calcium in magnesium silicate hydrate (M-S-H), *Applied Geochemistry*, 89, 229-242.
 22. Bernard, E., Dauzères, A., Lothenbach, B. (2018) Magnesium and calcium silicate hydrates, Part II: Mg-exchange at the interface “low-pH” cement and magnesium environment studied in a C-S-H and M-S-H model system, *Applied Geochemistry*, 89, 210-218.

23. Fernández, Á., Lothenbach, B., Alonso, M.C., García Calvo, J.L. (2018) Thermodynamic modelling of the short and long term hydration of ternary binders. Influence of the Portland cement composition and blast furnace slag content, *Construction and Building Materials*, 166, 510-521.
24. Le Saout, G., Lothenbach, B., Taquet, P., Fryda, H. and Winnefeld, F. (2018) Hydration of calcium aluminate cement blended with anhydrite, *Advances in Cement Research*, 30, 24-36.
25. Winnefeld, F., Martin, L., Müller, C., Lothenbach, B. (2017) Using gypsum to control hydration kinetics of CSA cements, *Construction and Building Materials*, 155, 154-163.
26. Miron, G.D., Wagner, T., Kulik, D.A., Lothenbach, B. (2017) An internally consistent thermodynamic dataset for aqueous species in the system Ca-Mg-Na-K-Al-Si-O-H-C-Cl to 800 °C and 5 kbar, *American Journal of Science*, 317(7), 755-806.
27. Adu-Amankwah, S., Zajac, M., Stabler, C., Lothenbach, B., Black, L. (2017) Influence of limestone on the hydration of ternary slag cements, *Cement and Concrete Research*, 100, 96-109.
28. Xu, B., Ma, H., Shao, H., Li, Z., Lothenbach, B. (2017) Influence of fly ash on compressive strength and micro-characteristics of magnesium potassium phosphate cement mortars, *Cement and Concrete Research*, 99, 86-94.
29. Bernard, E., Lothenbach, B., Le Goff, F., Pochard, I., Dauzères, A. (2017) Effect of magnesium on calcium silicate hydrates (C-S-H) *Cement and Concrete Research*, 97, 61-72.
30. Hargis, C., Lothenbach, B., Müller, C., Winnefeld, F. (2017) Carbonation of calcium sulfoaluminate mortars, *Cement and Concrete Composites*, 80, 123-134.
31. Bernard, E., Lothenbach, B., Rentsch, D., Pochard, I., Dauzères, A. (2017) Formation of magnesium silicate hydrates (M-S-H), *Journal of Physics and Chemistry of the Earth*, 99, 142-157.
32. Lothenbach, B., Bernard, E., Mäder, U. (2017) Zeolite formation in the presence of cement hydrates and albite. *Journal of Physics and Chemistry of the Earth*, 99, 77-94.
33. Schöler, A., Winnefeld, F., Ben Haha, M., Lothenbach, B. (2017) The effect of glass composition on the reactivity of synthetic glasses, *Journal of American Ceramic Society*, 100(6), 2553-2567.
34. Mäder, U., Jenni, A., Lerouge, C., Gaboreau, S., Miyoshi, S., Kimura, Y., Cloet, V., Fukaya, M., Claret, F., Otake, T., Shibata, M., Lothenbach, B. (2017) 5-year chemico-physical evolution of concrete-claystone interfaces, Mont Terri rock laboratory (Switzerland), *Swiss Journal of Geosciences*, 110(1), 307-327.
35. Shi, Z., Geiker, M.R., De Weerd, K., Østnor, T., Lothenbach, B., Winnefeld, F., Skibsted, J. (2017) Role of calcium on chloride binding of hydrated Portland cement – metakaolin limestone blends, *Cement and Concrete Research*, 95, 205-216.
36. Martin, L., Winnefeld, F., Tschopp, E., Müller, C., Lothenbach, B. (2017) Influence of fly ash on the hydration of calcium sulfoaluminate cement, *Cement and Concrete Research* 95, 152-163.
37. Schöler, A., Lothenbach, B., Winnefeld, F., Ben Haha, M., Zajac, M., Ludwig, H. (2017) Early hydration of SCM-blended Portland cements: A pore solution and isothermal calorimetry study. *Cement and Concrete Research*, 93, 71-82.
38. Chitvoranund, N., Winnefeld, F., Hargis, C.W., Sinthupinyo, S., Lothenbach, B. (2017) Synthesis and hydration of alite-calcium sulfoaluminate cement, *Advances in Cement Research*, 29(3), 101-111.
39. Durdziński, P.T., Ben Haha, M., Bernal, S.A., De Belie, N., Gruyaert, E., Lothenbach,

- B., Menéndez Méndez, E., Provis, J.L., Schöler, A., Stabler, C., Tan, Z., Villagrán Zaccardi, Y., Vollpracht, A., Winnefeld, F., Zajac, M., Scrivener, K.L. (2017) Outcomes of the RILEM round robin on degree of reaction of slag and fly ash in blended cements, *Materials and Structures*, 50(2), 135
40. Shi, Z., Geiker, M.R., Lothenbach, B., De Weerd, K., Ferreiro, S., Enemark-Rasmussen, K., Skibsted, J. (2017) Friedel's salt profiles from thermogravimetric analysis and thermodynamic modelling of Portland cement-based mortars exposed to sodium chloride solution, *Cement and Concrete Composites*, 78, 73-83.
 41. Bernal, S.A., Juenger, M.C.G., Ke, X., Matthes, W., Lothenbach, B., De Belie, N., Provis, J.L. (2017) Characterisation of supplementary cementitious materials by thermal analysis *Materials and Structures*, 50(1), 26.
 42. Fernández, Á., Alonso, M.C., García Calvo, J.L., Lothenbach, B. (2016) Physical-mechanical effect in ternary binders in function of the synergy between mineral additions and Portland cement type, *Materiales de Construcción*, 66(324): e097
 43. Vollpracht, A., Lothenbach, B., Snellings, R., Haufe, J. (2016) The pore solution of blended cements: a review. *Materials and Structures*, 49(8), 3341-3367
 44. Shi, Z., Lothenbach, B., Geiker, M.R., Kaufmann, J., Leemann, A., Ferreiro, S., Skibsted, J. (2016) Experimental studies and thermodynamic modeling of the carbonation of Portland cement - metakaolin - limestone mortars *Cement and Concrete Research*, 88, 60-72.
 45. L'Hôpital, E., Lothenbach, B., Scrivener, K., Kulik, D.A. (2016) Alkali uptake in calcium alumina silicate hydrate (C-A-S-H) *Cement and Concrete Research*, 85, 122-136.
 46. L'Hôpital, E., Lothenbach, B., Kulik, D.A., Scrivener, K. (2016) Influence of calcium to silica ratio on aluminium uptake in calcium silicate hydrate. *Cement and Concrete Research*, 85, 111-121.
 47. Kaufmann, J., Winnefeld, F., Lothenbach, B. (2016) Stability of ettringite in calcium sulfoaluminate based cement pastes at elevated temperatures. *Advances in Cement Research*, 28(4), 251-261.
 48. Wieland, E., Jakob, A., Tits, J., Lothenbach, B., Kunz, D. (2016) Sorption and diffusion studies with low molecular weight organic compounds in cementitious systems. *Applied Geochemistry*, 67, 101-117.
 49. Alahrache S, Winnefeld F, Champenois JB, Hesselbarth F, Lothenbach B. (2016) Chemical activation of hybrid binders based on siliceous fly ash and Portland cement. *Cement and Concrete Composites*, 66, 10-23.
 50. Trapote-Barreira, A., Cama, J., Soler, J.M., Lothenbach, B. (2016) Degradation of mortar under advective flow: Column experiments and reactive transport. *Cement and Concrete Research*, 81, 81-93.
 51. Nied, D., Enemark-Rasmussen, K., L'Hôpital, E., Skibsted, J., Lothenbach, B. (2016) Properties of magnesium silicate hydrates (M-S-H) *Cement and Concrete Research*, 79, 323-332.
 52. Dautères, A., Achiedo, G., Nied, D., Bernard, E., Alahrache, S., Lothenbach, B. (2016) Magnesium perturbation in low-pH concretes placed in clayey environment – solid characterisations and modelling. *Cement and Concrete Research*, 79, 137-150.
 53. Winnefeld, F., Lothenbach, B. (2016) Phase equilibria in the system $\text{Ca}_4\text{Al}_6\text{O}_{12}\text{SO}_4 - \text{Ca}_2\text{SiO}_4 - \text{CaSO}_4 - \text{H}_2\text{O}$ referring to the hydration of calcium sulfoaluminate cements, *RILEM Technical Letters*, 1, 10-16.
 54. Lothenbach, B., Nonat, A. (2015) Calcium silicate hydrates: solid and liquid phase composition. *Cement and Concrete Research*, 78, 57-70.

55. Martin, L., Winnefeld, F., Müller, C., Lothenbach, B. (2015) Contribution of limestone to the hydration of calcium sulfoaluminate cement. *Cement and Concrete Composites*, 62, 204-211.
56. Renaudin, G., Mesbah, A., Dilnesa, B.Z., Francois, M., Lothenbach, B. (2015) Crystal chemistry of iron containing cementitious AFm layered hydrates, *Current Inorganic Chemistry (Bentham). Special issue on 'Green Rust and Related Iron Containing Compounds: Structure, Redox Properties and Environmental Applications'*, 5(3) 184-193.
57. Myers R.J., L'Hôpital, E., Provis J.L., Lothenbach, B (2015) Composition-solubility-structure relationships in calcium (alkali) aluminosilicate hydrate (C-(N,K)-A-S-H), *Dalton Transactions*, 44, 13530-13544.
58. Lothenbach, B., Nied, D., L'Hôpital, E., Dauzères, A. (2015) Calcium and magnesium silicate hydrates (M-C-S-H) *Cement and Concrete Research*, 77, 60-68
59. Vespa M., Wieland, E., Dähn, R., Lothenbach, B. (2015) Identification of the thermodynamically stable Fe-containing phase in aged cement pastes. *J. Am. Ceram. Soc.*, 98(7), 2286-2294.
60. Myers, R.J., Lothenbach, B., Bernal, S., Provis J.L. (2015) Thermodynamic modelling of alkali-activated slag cements. *Applied Geochemistry*, 61, 233-247.
61. Burnat, D., Schlupp, M., Wichser, A., Lothenbach, B., Gorbar, M., Zuttel, A., Vogt, U.F. (2015) Composite membranes for alkaline electrolysis based on polysulfone and mineral fillers. *Journal of Power Sources*, 291, 163-172.
62. Winnefeld, F., Ben Haha, M., Le Saout, G., Costoya, M., Ko, S. Lothenbach, B. (2015) Influence of slag composition on the hydration of alkali-activated slags. *Journal of Sustainable Cement-Based Materials*, 4 (2), 85-100.
63. Rossen, J., Lothenbach, B., Scrivener, K.L. (2015) Composition of C-S-H in pastes with increasing levels of silica fume addition. *Cement and Concrete Research*, 75, 14-22.
64. L'Hôpital, E., Lothenbach, B., Le Saout, G., Kulik, D., Scrivener, K. (2015) Incorporation of aluminium in calcium silicate hydrates. *Cement and Concrete Research*, 75, 91-103.
65. Roosz, C., Grangeon, S., Blanc, P., Montouillout, V., Lothenbach, B., Henocq, P., Giffaut, E., Vieillard, P., Gaboreau, S. (2015) Crystal structure of magnesium silicate hydrates (M-S-H): the relation with 2:1 Mg-Si phyllosilicates, *Cement and Concrete Research*, 73, 228-237.
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