

# Editorial

## John Provis

Professor, Department of Materials Science and Engineering, University of Sheffield, Sheffield, UK

It is a pleasure to present to you this issue of *Advances in Cement Research*, which compiles a set of papers related to highly topical areas within the cements research community, spanning areas of materials design, production, characterisation and durability testing. While each of these areas is important in its own right, it is essential that all of these steps in the cement value chain are able to be effectively combined, to enable cement to be used in an effective and efficient manner in meeting the needs and demands of our society.

In an area related to the production of traditional construction materials, the paper of Liu *et al.* (2015a) describes the process of dehydration of gypsum via the application of Raman spectroscopy, and demonstrates that both the mineralogy and thermal history of a gypsum sample are important in defining the relationship between the dihydrate, hemihydrate and anhydrite forms generated during heating.

Moving to the field of alternative cementing systems, Kovtun *et al.* (2015) have developed an innovative dry-mix alkali-activated binder based on blast furnace slag, solid sodium carbonate, and sodium lignosulfonate. Similar mixes have generally been found to gain strength very slowly at ambient temperature, but these authors have shown that the acceleration of the reaction by a mixture of slaked lime and silica fume is able to yield a high 1-day strength without the application of heat curing.

The work of Daoui *et al.* (2015) is also focused on the use of wastes to produce key components of cementing systems, this time in the production of flow-enhancing admixtures for self-compacting concretes through the chemical digestion of waste pine wood.

Related to the characterisation of cementitious materials, Liu *et al.* (2015b) have developed a quantitative approach to the measurement of dispersion of carbon nanotubes within cementitious composites, while Pourbeik *et al.* (2015) provide new insight into the mechanical properties of calcium silicate hydrate phases through aggressive drying and regeneration processes.

Finally, and in terms of durability characterisation of cementitious

materials, Liu *et al.* (2015c, 2015d) have contributed a pair of papers related to the development of a more complete understanding of the process of sulfate attack on Portland cement. The importance of the aqueous exposure environment in determining the mechanism and products of sulfate attack is becoming more evident through studies such as these, raising important questions related to both the testing methodologies used to assess this process, and also the design of materials to resist sulfate attack.

So, through this collection of papers, the full lifecycle of cementitious materials from formulation to degradation is better understood and described. We trust that you will find this issue of *Advances in Cement Research* to be valuable and interesting.

## REFERENCES

- Daoui A, Safi B, Rezak M and Zerizer A (2015) Use of wood waste (Aleppo pine) as a superplasticiser in self-compacting mortars. *Advances in Cement Research* **27(8)**, 458–464, <http://dx.doi.org/adcr.14.00043>.
- Kovtun M, Kearsley EP and Shekhovtsova J (2015) Dry powder alkali-activated slag cements. *Advances in Cement Research*, **27(8)**, 448–457, <http://dx.doi.org/adcr.14.00078>.
- Liu F, Sun Z and Qi C (2015a) Raman spectroscopy of the dehydration process of gypsums. *Advances in Cement Research* **27(8)**, 435–447, <http://dx.doi.org/adcr.14.00086>.
- Liu Q, Sun W, Ma Z *et al.* (2015b) A quantitative method for analysing the dispersion of carbon nanotubes in cement composite material. *Advances in Cement Research* **27(8)**, 465–470, <http://dx.doi.org/adcr.14.00035>.
- Liu K, Deng M, Mo L and Tang J (2015c) Deterioration mechanism of Portland cement paste subjected to sodium sulfate attack. *Advances in Cement Research*, **27(8)**, 478–487, <http://dx.doi.org/adcr.14.00051>.
- Liu K, Deng M and Mo L (2015d) Influence of pH on the formation of gypsum in cement materials during sulfate attack. *Advances in Cement Research*, **27(8)**, 488–494, <http://dx.doi.org/adcr.14.00076>.
- Pourbeik P, Beaudoin JJ, Alizadeh R and Raki L (2015) Drying of calcium-silicate-hydrates: regeneration of elastic modulus. *Advances in Cement Research*, **27(8)**, 471–477, <http://dx.doi.org/adcr.14.00048>.