Porosity characterization of intact concrete specimens

Q. I. Roode-Gutzmer, J. Kulenkampff, A. Barkleit, T. Stumpf
Institute of Resource Ecology

Background / Motivation

- MIP measurement in accordance with ISO 1509
- SEM
- Institute of Q.I.
- intact concrete specimens
- Porosity characterization of concrete shielding biological orosity structure pore change in
- Quirina Isabella Roode
- CT: connected pores in 1D on nanoscale (quantitative / destructive)
- : porosity in 2D on nano
- : total porosity in 3D on microscale (quantitative / non-destructive)
- Roode (TU Dresden) and V. uncoated
- 4,300 X sample
- SEM
- thickness map
- Experimental procedures / Evaluating initial pore structure
- Distribution curves determined by MIP
- µm
- to micro
- 0.01 g)
- 0.99 g
- Experimental outcomes / Future objectives
- Porosity of small intact specimens (0.15 ± 0.01 g) were characterized.
- MIP: connected pores in 1D on nanoscale (quantitative / destructive)
- SEM: porosity in 2D on nano- to micro-scale (qualitative / semi-destructive)
- µ-CT: total porosity in 3D on microscale (quantitative / non-destructive)
- MIP: hysteresis due to deviation from capillary bundle model
- ink-bottle effect (large pores with narrow throats)
- smaller pores over-estimated at expense of larger pores
- specific surface area MIP > N₂/BET due to tracking and non-equilibrated capillary pressure
- Examining radiation-induced changes in 3D:
- shrinkage of hydration phases
- expansion of aggregates
- tracking ASR-formation

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