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Porosity evolution of artificially weathered sandstones: how reliable are porosimetric measurements for durability prediction?

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Several types of sandstones were subjected to artificial weathering (cycles of freezing/thawing, salt crystallization). After termination of certain number of cycles (the highest one was 144 cycles), part of specimens were removed and tested for various physical properties. In the recent study, we have focused on the analysis of pore space textural characteristics by means of mercury porosimetry. From the raw data, several durability indices previously proposed in literature were computed. Despite macroscopically visible damage produced by artificial weathering, most of the examined materials were classified as resistant against respective weathering processes by those indices. Additional observation of rock microfabric conducted by SEM-EDS revealed features which must be taken into account during evaluation of durability of porous materials. Therefore, porosimetric data alone cannot be used as a single durability estimate.