Suppression of Alkali Silica Reaction using H^+-Type Geopolymer

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We prepared a H^+-form geopolymer powder by grinding a Na^+-form geopolymer hardened paste and processing it with sulfuric acid. At pH 7, the extent of cation exchange with Na^+ and K^+ ions of the H^+-form geopolymer powder was one-fourth of that of the original Na^+-form geopolymer at the same pH. The ion-exchange capacity of the H^+-form geopolymer powder shows pH dependence, that is, has a tendency to increase with the increase of pH. 10 mass% addition of the H^+-form geopolymer reduced both pH and soluble alkali quantity of the hardened cement pastes more compared to the non-addition one. Further, the injection of cement paste of 40 mass% addition of the H^+-form geopolymer suppressed expansion of ASR more compared to that of the non-addition one.