

# Committee Report: JCI-TC155A

## Technical Committee on Application of Geopolymer Technology to Construction Field

### 委員会報告：JCI-TC155A 建設分野へのジオポリマー技術の適用に関する研究委員会

Kazuo ICHIMIYA, Dr. Eng.: National Institute of Technology, Oita College

一宮 一夫, 博士 (工学) : 大分工業高等専門学校

Shigemitsu HATANAKA, Dr. Eng.: Mie University

畑中 重光, 博士 (工学) : 三重大学

Daiki ATARASHI, Dr. Eng.: Shimane University

新 大軌, 博士 (工学) : 島根大学

Minoru KUNIEDA, Dr. Eng.: Gifu University

国枝 稔, 博士 (工学) : 岐阜大学

Hiroki GODA, Dr. Eng.: Kyushu Institute of Technology

合田 寛基, 博士 (工学) : 九州工業大学

Koji HARADA, Dr. Eng.: Nishimatsu Construction Co., LTD.

原田 耕司, 博士 (工学) : 西松建設

**Contact:** [jci-web@jci-net.or.jp](mailto:jci-web@jci-net.or.jp)

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## Abstract

Geopolymers have small CO<sub>2</sub> emissions at the time of production, can be effectively used in various industrial byproducts, and are excellent in resistance to alkali silica reactions, strong acids and high temperatures. However, before its practical use, many issues remain to be resolved, such as the solidification mechanism not being clear, and little information being available on its long-term properties.

This technical committee was established for the purpose of compiling the existing domestic and international knowledge on geopolymer technology and clarifying the geopolymer system and expected quality, exploring the manufacturing method for geopolymers in the construction fields in Japan, and making proposals for the application of geopolymers to the construction fields in Japan. This paper is an outline of the results of the technical committee's activities over a two-year period.

## 1. Introduction

Geopolymer is defined as “Geopolymer is not use cement clinker, and a solidified body is obtained from a mixture of raw materials mainly composed of amorphous aluminum silicates and at least one kind of an aqueous solution which is used alkali metals such as silicate, carbonate, hydroxide.” and generally based on fly ash and sodium silicate, are often supplemented with ground granulated blast-furnace slag(GGBS) or sodium hydroxide in order to promote solidification. Its major characteristics are low carbon emission because

no use of clinker, and does not always require calcium for solidification, so it is excellent in acid and high temperature resistance, and can consume large amounts of industrial byproducts such as fly ash. On the other hand, many issues remain to be resolved for practical application, such as the solidification mechanism has not been sufficiently clarified, the mixture where the characteristics of geopolymers can be shown is extremely specific, geopolymers are higher cost than conventional concrete, and there is.....