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(71)**Name of Applicant :**
1)Avuthu Narender Reddy
Address of Applicant :10-51, main road, chinaparimi, tsundur madal, guntur, andhra pradesh ---------- ----------
2)Dr. G. Gautham Kishore Reddy
3)Dr. Prathik kulkarni
4)Dr. Cholkar Arvind Kumar
5)Y. Sudha Madhuri
6)Dr. B. Krishna Chaitanya
Name of Applicant : NA
Address of Applicant : NA
(72)**Name of Inventor :**
1)Avuthu Narender Reddy
Address of Applicant :Department of Civil Engineering, Guru Nanak Institutions Technical Campus (A), Hyderabad, Telangana, India - 501506. Hyderabad ---------- ----------
2)Dr. G. Gautham Kishore Reddy
Address of Applicant :Department of Civil Engineering, Vignan Institute of Technology and Science (A), Deshmukhi (V), Pochampally (M), Yadadri - Bhuvanagiri District, Telangana, India - 508284. Pochampally ---------- ----------
3)Dr. Prathik kulkarni
Address of Applicant :Department of Civil Engineering, Bajaj Institute of Technology, Pipri Road, Wardha, Maharashtra, India - 442001. Wardha ---------- ----------
4)Dr. Cholkar Arvind Kumar
Address of Applicant :Department of Civil Engineering, Matrusri Engineering College, Hyderabad, Telangana, India- 500059 Hyderabad ---------- ----------
5)Y. Sudha Madhuri
Address of Applicant :Department of Civil Engineering, Gurunanak Institutions Technical Campus, Hyderabad. Pincode: 501506 Hyderabad ---------- ----------
6)Dr. B. Krishna Chaitanya
Address of Applicant :Department of Civil Engineering, R.V.R.& J.C College of Engineering (A), Guntur District, Andhra Pradesh, India -522019. Guntur ---------- ----------

(57) Abstract :
This research examines the durability of geopolymer concrete (GPC) and ordinary Portland cement (OPC) concrete when exposed to sulphuric acid and sulphate attacks for 180 days. Samples of both GPC and OPC were immersed in solutions containing 3% H_2SO_4, 5% $MgSO_4$, and 5% Na_2SO_4. The changes in compressive strength and weight were recorded at 28, 56, 90, and 180-day intervals. The findings indicated that GPC displayed greater resistance to acid attack, with compressive strength reductions of 10%, 21%, 26%, and 45% at the respective time points, in contrast to 18%, 36%, 55%, and 73% for OPC. Additionally, GPC showed enhanced resistance to sulphate attack, exhibiting less significant decreases in compressive strength and weight compared to OPC. This difference was particularly evident in the $MgSO_4$ solution, where OPC underwent substantial degradation. These results highlight the potential of GPC as a more resilient alternative to OPC in harsh environmental conditions.

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