

THERMAL ANALYSIS OF PORTLANDSEMENT OBTAINED ON THE BASIS OF FLOTATION WASTE FROM THE ENRICHMENT FACTORY "HONJIZA"

Khamzaev N. J.

Turaev Kh. Kh.

Eshmurodov X.E.

Termez State University

Introduction

Currently, various types of Cements are produced in the world - hydrophobic, sulfate, acid, alkali and salt-resistant, adapted to different conditions[1]. A thermal analysis has been performed to study the effect of additives on cement properties and the properties of phase changes in cement stone depending on the time of hydration of the cement. In thermal analysis, an endoeffect was detected at 200°C [2]. It has been reported that calcium hydroxide is converted to calcium hydroalumosilicate, while exoeffect at 900°C corresponds to the crystallization of calcium silicate and aluminate. The established properties of the hydration of cement with active mineral additives cause it to undergo complex physicochemical changes in the solidification process [3]. To study these, the properties of modified cement, cement pastes and the concretions obtained on their basis are determined [4]. This study found that the rational amount of additive added to portlandsement should be 10-20% relative to the mass of cement. It has been noted that the high pressure force is 54.5 MPa, equal to 7.7 MPa for bending, and on average 10% more than regular cement [5].

The enrichment factory "honjiza" is thermogravimetric (TG) and differential thermal analysis (DTA) of portlandsement, obtained on the basis of flotation emissions. 9.32 mg was taken from portlandsement and its TG-DTA analysis was studied in the 10-800°C temperature range. In thermal analysis, there were two endothermic effects, the first observed at temperatures of 138.06 °C and the second at temperatures of 504.07 °C. The thermogravimetric (TG) curve of the resulting portlandsement was realized over a temperature range of 1 intensive mass loss. The mass loss range of the TG curve was observed at a temperature of 457.03-545.62°C (Fig.1).



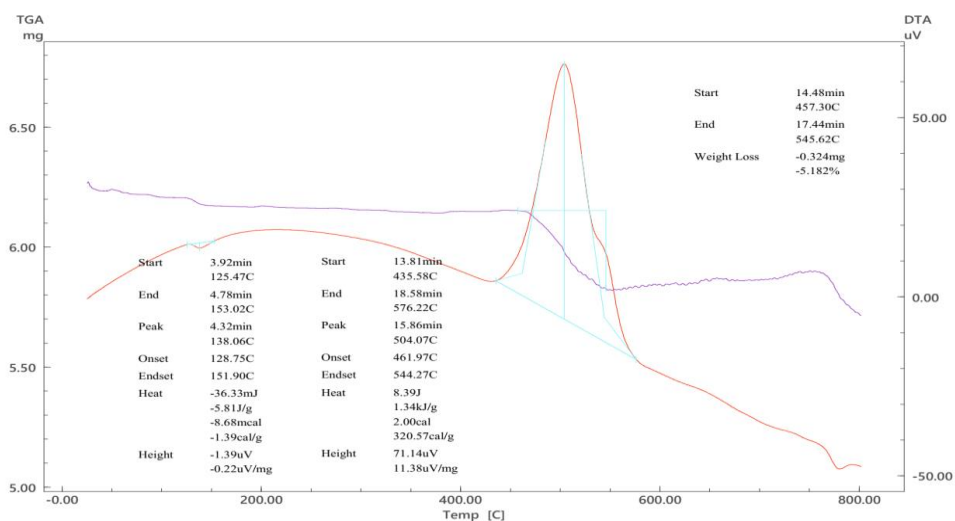


Fig. 1. Thermogravimetric (TG) and differential thermal (DTA) analysis of portland cement obtained on the basis of flotation waste of "Khonjiza" concentrator

Thermogravimetric (TG) and differential thermal analysis (DTA) results of the obtained portland cement show that 5.182% mass loss can be observed in the mass loss interval. The results of differential thermal analysis of modified bitumen show that energy absorption occurs in the temperature range of 457.30-545.62°C. Also, a more extensive analysis of the results of the TG and TDA curves of this modified bitumen is detailed in (Table 2).

Table 2 Thermogravimetric and differential thermal analysis of portland cement obtained on the basis of flotation waste of "Khonjiza" enrichment plant

| No | Temperature, °C | Lost mass, mg | Lost mass, % | Amount of consumed energy (μV*s/mg) | Residual mass, dw, (mg) |
|----|-----------------|---------------|--------------|-------------------------------------|-------------------------|
| 1 | 100 | 9,32 | 0,836 | 5,18 | 9,11 |
| 2 | 200 | 8,12 | 1,336 | 8,27 | 7,456 |
| 3 | 300 | 7.35 | 2,086 | 12,9 | 6,847 |
| 4 | 400 | 5,48 | 2,636 | 16,3 | 5,214 |
| 5 | 500 | 4,987 | 3,116 | 19,3 | 3,124 |
| 6 | 600 | 4,132 | 5,182 | 24,7 | 2,874 |
| 7 | 700 | 3,857 | 5,436 | 33,68 | 1.145 |
| 8 | 800 | 1,587 | 6,236 | 38,6 | 0,982 |



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