PRODUCTION OF WHITE TEXTURED PAINTS USING SILICATE WASTE

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The paint is widely used for coloring various objects or for pigmented coating of the surface for a decorative or protective effect. There are many types of paint, the use of which is decided according to the purpose and use of the object. Titanium oxide is used as a bleaching agent in the production of white silicate water-based paints, which has the highest value in the total cost of the paint. The aim is therefore to look for a way in which at least part of it can be replaced by cheaper components or even production waste.

One such waste could be the phosphogypsum formed by AB „Lifosa“, calcium sulphate, which is visually very white. The aim of this work is to produce white, textured, water-based paints using silicate waste - phosphogypsum, which would correspond in quality to industrial paints. Preliminary studies have shown that phosphogypsum is only suitable as a dye filler. The study produced high-quality paints that complied with paint regulations.

In the work we used analogous raw materials used by one of the silicate paint manufacturers in Lithuania UAB “Maestro team”.

Table 1. Chemical composition of paints produced

Materials	H_2O	Bermocoll Prime 1000	20 % KOH	Oratan 4045	Faomaster 8034	Phosphogypsum with 5% CaO	TiO_2	Ground marble	Dolomite	Acrylic resin dispersion	Crysol TT935
Composition,%,	24	0,4	0,2	0,2	0,1	0…50	3…5	1…5	1…25	20	0,1

Studies on the effect of phosphogypsum content on paint properties have shown that it can be added to the mass up to 30 %. However, the addition of phosphogypsum significantly acidifies the mass, causing the paint to lose its performance relatively quickly. Continuing the work, it was found that using a small amount of CaO in the paint mixture can produce paints that match the properties of industrial paints in terms of physical and mechanical properties: such paints have a higher whiteness, better wet cleaning resistance, the same coverage as industrial paints.

We can draw the following conclusions:

1. The use of phosphogypsum as a filler can reduce the amount of TiO_2 in paints and produce whiter paints than existing industrial paints. Its permissible amount is up to 30 %.

2. The use of an additional preservative CaO can extend the life of the paint and improve other physical properties. It should be added 5 % of the phosphogypsum content.

References

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