PROCESSING AND RECYCLING OF POLYMER-COATED WASTE PAPER

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The technology of recycling polymer coated wall-paper waste was developed. Design included the first stage of shredding waste paper with chopper-disk and milling. During the second stage, shredding was carried out on drum mills with separation of cellulose fiber from polymer coating. The third stage consisted of separation of two fractions: polymer coating and cellulose fiber. As a result of this process, 50-95% of pure cellulose and 5-50% solid polymer waste were obtained. Obtained cellulose could be used for technical paper and packaging carton, as structural filler in the construction, etc., polymer-coated wastes are used for construction and composite materials.

5%-12% of wallpaper coated with PVC film is defected and has to be utilized. Burning PVC leads to the development of toxic substances such as hydrogenchloride, phosgene i dioksini. Therefore, burning of such wallpaper is extremely dangerous from the ecological standpoint. Processing of wallpaper and its use as waste paper is also difficult due to the large amount of additives on the surface of the paper.

In this research study, we have developed the two-stage method of processing these wastes. At the first stage, the wastes underwent chopper-disk and milling. During this, cellulose did not separate from the polymer coating, and the majority of polymer coated paper pieces has the surface of 15-100 cm^2. At the second stage, the wastes went through chopper-disk and milling again. After the розсіву of wallpaper, we obtained cellulose (weight of 45-60 % and volume of 70-90%) in the fraction which consisted of cellulose and fiber.

The major findings of this study include the following:

1. The proposed method allows for the high degree separation of the shredded wallpaper wastes.
2. The proposed method leads to the elimination of harmful wastes in the form of gas and dust into the environment.
3. The proposed method is universal for the utilization of paper and coated wall paper. In addition, it ensures ecological safety of the overall production and leads to saving wood and other natural resources in paper production.
4. Cellulose can be used for the additional obtainingof technical paper and packaging carton, as structural filler in the construction industry, for the production of asbestos-free slate and fuel briquettes and pallets.