

# Materials and Technologies for Sustainable Production

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## Utilization of Spent Detergent Solutions of the Specialized Agricultural Machinery Repair Shop

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**Keywords:** repair shop, spent detergent solutions, synthetic detergent solutions, water-oil emulsions, oil-containing sludges, lubricants, forms of reinforced concrete structures. used plate lubricants.

**Abstract.** The composition of spent detergent solutions of the repair shop of special agricultural machinery, which is based on the use of synthetic detergents, was studied. The technological scheme of oil preparation on the basis of the spent detergent solutions, water-oil emulsions and oil-containing slimes was developed. The obtained oil was used for lubrication of the forms of reinforced concrete structures.

### Introduction

Currently, the treatment of effluents located in the basins of rivers flowing into the Azov and Black Seas is of particular relevance. Existing methods of wastewater treatment from oils, surfactants, heavy metal ions do not always provide a given treatment object or are difficult to operate. Therefore, there is a need to develop new reliable, efficient and environmentally friendly methods of the spent detergent solutions. Therefore, the study of the processing of spent detergent solutions and oil-containing wastewater from the mechanical shop of the repair and mechanical plant, formed in the areas of degreasing, diesel washing, steaming chambers of the vertical type, and determines the relevance of the chosen research direction.

### Analysis of Publications

As a result of the analysis of production activity on the repair enterprises the oil-containing waste, dangerous for environment, is formed. However, aspects of their utilization are insufficiently covered in the literature. Taking into account the relevance of research, the authors of the article studied ways to reduce the amount of oil-containing waste for the disposal of spent plastics (PM). The technology of preparation of fine water-oil emulsion on the basis of the spent oil with high stability by means of a pneumatic radiator was developed. The resulting emulsion was a dispersed system in which the role of the dispersion medium was performed by spent PM, and the dispersed phase was water in the droplet form. The possibility of preparation of water-oil emulsion on the basis of spent plastic oils by means of shock waves generated by a pneumatic radiator was proved. Subsequently, the emulsion was used as an anti-adhesive coating applied to the surface of the molds in the manufacture of reinforced concrete products [1]. The authors propose the use of oil extracted from wastewater taken from contaminated areas on the oil platform of Alexandria Harbor, by the method of agglomeration and foam flotation for the calcium oil preparation. After flotation, the extracted oil showed a higher viscosity and a higher content of asphaltene compared to the primary base oil. In addition, the pop-up oil contained a high percentage of resins, which indicates the possibility of using reduced oil mixed with the primary base oil in the preparation of lubricants [2].

The method of spent detergent solutions and lubricants processing is considered in the engineering solution (patent) [3]. This method includes the supply of spent detergent solutions, lubricants and water to the apparatus, which is equipped with heating elements, heating of the substances, contained in the apparatus, before boiling, holding at boiling temperature until the