



11–12 October 2012, Riga

**Riga Technical University
53rd International
Scientific Conference**

Dedicated to the 150th Anniversary and
The 1st Congress of World Engineers and
Riga Polytechnical Institute / RTU Alumni

DIGEST



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Collection of Spilled Oil Products by Means of Ferromagnetic Powder Materials

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Keywords – ferromagnetic powder, oil spills, collection.

I. INTRODUCTION

Current research covers an evaluation of ferromagnetic powder materials for use as a collector of spilled oil products [1]. Extensive testing of different powders has been carried out. Current work continues a previous research on use of ferromagnetic powder materials as a collection agent for spilled oil products [2,3].

II. THEORETICAL BACKGROUND

The ability of metal powder to collect spilled oil is associated with the surface structure of powder particles (Fig. 1) [4]. Sorption and adhesive properties of iron powders allow collecting of spilled oil products, followed by removal of a mixture of powder and oil by means of permanent or electromagnets.

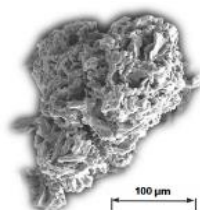


Figure 1. Particle of Hoganas iron powder M20/80-19.

III. EXPERIMENTAL PART

Waste motor oil was used for experiments. In the Fig. 2 below one of testing samples is shown. Spilled oil layer has the following dimensions: diameter 95 mm, thickness 4 mm, the amount of spilled oil 28 ml

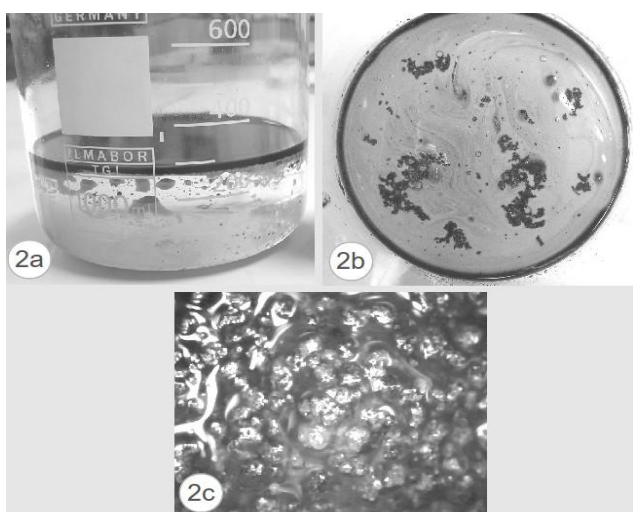


Figure 2. Experiments on collection of spilled oil products. 2a) layer of spilled oil floating above a sweet water, 2b) Most of spilled oil is captured by iron powder, 2c) Mixture of spilled oil and iron powder in form of sludge.

Experimental studies have shown that without additional processing [5] of iron powder it is possible to capture up to 0.90-1.25 g of spilled oil per 1 g of iron powder.

IV. CONCLUSIONS

Previous and ongoing research has shown an ability of iron powders in capturing and retention of spilled oil products. Due to extended surface of iron powder particles and adhesion to oil substances such materials can be considered as spilled oil collection agents for certain emergency cases.

V. FURTHER WORK

A local raw material – iron dross (produced by Liepajas Metalurgs metallurgical plant) will be tested as an alternative to more expensive commercial iron powders cheap spilled oil collection agent. An affordable method of “iron powder-oil product” sludge processing should be investigated.

VI. ACKNOWLEDGEMENTS

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