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ACCEPTED MANUSCRIPT

INFLUENCE OF ELECTRET STATE OF TWO-LAYER POLYMER MATERIALS ON THEIR ADHESION TO METAL SUBSTRATES

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Abstract. Adhesion activity to metals of two-layer polyethylene – poly ethylene-co-vinyl acetate and the corona electrets based on them was studied. It was shown that the electret state of two-layer film polymer materials help to improve their adhesion characteristics. This improvement is due to the appearance of electric fields that enhance adhesion and increases the mechanical strength of two-layer materials.

Keywords: adhesion, metal, surface treatment by excited gas, peel strength, polyethylene, polyethylene-vinyl acetate copolymer

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1. Introduction

In recent times, heat-shrinkable sleeves have been used for anticorrosive insulation of butt joints in water, oil and gas pipelines. These sleeves consist of two layers - polyethylene and a thermoplastic adhesive where commonly poly ethylene-co-vinyl acetate is used [1]. At the same time polymeric electrets are becoming more common in production units and systems. Electret is a dielectric that preserves its polarized state after removal of the external voltage which led to the polarization thereby creating a quasi-permanent electric field in the

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