

Studying the Effect of Both Gas Oil and Diesel Fuel on Polypropylene-Polycarbonate Reinforcement with Carbon Black

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ABSTRACT

In the present research, the diffusion of prepared sample blends (PP/PC) unfilled-filled with different amounts of carbon black (2 – 7) wt% and at different temperatures (25°C, 40°C and 55°C) were studied. Absorption test was carried out in (Gas-Oil and Diesel-Fuel) at different immersion times as: Two Conditions were used to calculate the diffusion coefficient values. In the first Condition

$\left[\pi \left(\frac{KL}{4M_{\infty}} \right)^2 / 60 \right]$, the diffusion coefficient values ranged from (0.252 to 1.619)

cm²/sec for immersed in Gas-Oil and it ranged from (0.321 to 1.783) cm²/sec for

immersed in Diesel-Fuel. In the second Condition $\left[\pi \left(\frac{\theta}{4} \right)^2 / 60 \right]$ the diffusion

coefficient values ranged (0.37 to 2.649) cm²/sec for immersed in Gas-Oil and it ranged from (0.562 to 2.635) cm²/sec for immersed in Diesel-Fuel. It was found that the results obtained by the two equations were approximately the same. Indeed the blend (PP/PC) filled with (4 wt%) of carbon black has the lowest values of diffusion coefficient (calculated by the above two equations) in Gas-Oil and Diesel-Fuel which indicates this sample has better performance than other samples. The diffusion test also was carried out at different temperatures in order to show the effect of temperature on diffusion coefficient. It was found that the diffusion coefficient values increase with increasing temperature. All these samples are obeyed Fickian behavior and the activation energy (E) increases with increasing amounts of carbon black (2 – 7) wt%.

دراسة تأثير زيت الغاز ووقود الديزل على المخلوط البوليمري المكون من بولي
كاربونات المدعم بالكربون الاسود بروبيلين- بولي

الخلاصة

في هذا البحث تم تحضير مخاليط مختلفة من بولي- بروبيلين وبولي كاربونات الغير المدعمة والمدعمة بنسب وزنيه مختلفة من الكربون الاسود (السخام) % (2 - 7) وعند درجات حراره مختلفه (25, 40 و 55 °م, حيث تم غمر النماذج في زيت الغاز ووقود الديزل وملاحظه امتصاصيه