

## **Intelligent Nanomaterials: Processes, Properties, and Applications**

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### **Polymer/layered silicates nanocomposites for barrier technology**

Labuschagne, PW, Moolman, S and Maity, A.

Corresponding author: PLabusch@csir.co.za

#### **Abstract only**

Plastics are used increasingly in packaging applications due to a number of favorable properties, such as versatility, low weight, and low cost. However, their biggest drawback when compared to traditional packaging materials, such as glass and metals, is their relatively high permeability to gases and vapors. Specifically in food and beverage packaging, low permeability to oxygen is critical. This area of research has challenged polymer scientists, material scientists, physicists, and chemists all over the world to fabricate new nanocomposite materials for specialized applications. They have shown that the incorporation of layered silicates can significantly reduce the permeability of gases through plastics. This chapter is aimed at highlighting the interesting potential aspects of research on selective hybrid nanocomposite materials. The effect of aspect ratio and the degree of clay exfoliation and polymer-clay interaction on the gas permeability will be discussed along with the effect of the types of organic modifier, polymer chemical structure, nature of compatibilizer, blending sequence, processing conditions as well as clay loading on these properties.