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Plasma surface treatment of recycled polymers for food packaging

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The change of habit and the increase in consumerism in the last decades have led to technological innovations and consequently to the greater production of consumer products, which has generated an increase in the production of packaging. However, its disorderly disposal generates a large volume of solid waste, which is associated with the environmental impact. Concern for this situation, we ought to develop alternative means to reduce such impacts and may highlight the reuse and recycling of packaging. Plastics represent the largest share in the value of Brazilian packaging production, corresponding to 38.85% of the total. The employment level of the packaging industry reached 216973 jobs in June 2017. The plastic industry is the one that most employs, totaling in June 2017, 115307 formal jobs, corresponding to 53.14% of the total jobs in the sector. The plastics sector accounts for 59.58% of total imports. With respect to the results obtained in the last 10 years of research, the reuse of recycled commercial polymers by plasma surface treatment is emphasized. Then, it is possible to change the character of wetting of the polymers, being able to obtain high hydrophobic or high hydrophilic surfaces, maintaining very smoothness, high optical transparency in the visible region (up to 80%) and improving gas barrier (down to 1 g/m²day) mainly for PET and LDPE, which makes the plasma immersion treatment interesting for the food packaging.

Biography

Péricles Lopes Sant'Ana has obtained his Bachelor's degree in Production Engineering from Federal University of Viçosa, Brazil. He has completed his Master's and Doctoral degrees in Materials Science and Technology from the State University of Sao Paulo. He has 10 years of experience in research and development, working with plasma surface treatment and thin films deposition for food packaging and optical devices. Recently he has developed PVC, PET and LDPE polymers using plasma immersion techniques.

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