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Hydrogen, methane and coke production from pyrolysis of bituminous and recycling plastic mixtures

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At the advent of the 21st century, mankind is facing global environmental problems, causing the industrial se ctor to take initiatives in establishing recycling for the efficient utilization of our natural resources. Conversion of polymeric materials into useful products has been attaining recognition in recent years. Hydrogen is an essential raw material in the hydrogenation process in the chemical industry and plays a significant role in hydrocarbon synthesis. The samples of bituminous coal from Maghara coalmine were mixed with an admixture of waste plastics (PET) in different amounts for producing hydrogen and gases hydrocarbons. In the recycling process of waste plastic using coke oven, sub-bituminous coals and added plastics are carbonized and changed into coke, tar, hydrogen and gases hydrocarbons. Hydrocarbons (CH4, C2H4, C2H6, C3H6, C3H8 and the sum C-4) were determined using a flame ionization detector. The results shows that the highest amount of gases is for H2 in all type of prepared samples ranging from 40.71% from coal/PET (90/10) to 41.48% in hard coal. The second highest value in a range defined by CH4 ranging from 24.45% coal/PET (80/20) to 27.51% in hard coal. The results demonstrated that in case of co-processing with 5% of waste plastics are promising for coke, tar and gas production. Micro-textural analysis of coke contains information on fused and un-fused components, on pores, coke walls, inertinite and macerals and on optical anisotropy.

Biography

Ahmed A Melegy has his expertise in Environmental Geology in improving understanding of how the environmental enhances. He has completed his PhD degree from Charles University-Czech Republic in 1998. Currently, he is a Professor and Head of Geological Sciences, Department in National Research Centre- Dokki-Cairo- Egypt. He has many experiences in calculating mass balances in different catchments, monitoring inputs and outputs of heavy metals, remediation and using XPS through Nano surface. He is Reviewer for many international journals. He has 15 international projects. He has participated in 30 conferences. He has more than 70 publications in international journals.

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