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## Purification and application of pyrolytic carbon char in paint formulations

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In waste tyre pyrolysis process, the generation of pyrolytic char (PT-char), a byproduct, is problematic as it has a minimum market value due to the presence of many impurities. In order to improve the market value of the PT-char, economical and efficient purification method was introduced in this study. PT-char samples were sieved, magnetically separated, and purified with dilute acids and/or bases or combination of both. Raw sample (sample A) and three more purified samples (Sample B –washed once with acid, Sample C – washed twice with acid and Sample D – washed twice with acid followed by washed once with a base) were prepared and characterized by TGA, Elemental analysis, SEM/EDX and XRD. The results obtained for the samples were compared with those of commercially available carbon black: N330. Carbon wt% of raw pyrolytic char was ~78% and it was increased to ~84%, ~86%, and ~89% in samples B, C, and D respectively. XRD peaks appeared for ZnO and ZnS impurities were completely disappeared in C & D samples. All four samples, A to D, were then incorporated in paint formulations and investigated their suitability as pigments in paints. Samples C & D were easy to process in grinding to be added in paints. Opacity, color strength, Gloss @60 of the paint developed from sample C was comparable to the standard paint formulated using commercial Ravan black. Sample C & D had better tint tone properties when they were blended with Ravan black 98:8.5 ratio. In conclusion, pyrolytic char is suitable as a black color pigment in paints when it is washed with diluted HCl and NaOH.

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