

An one - step refining process of waste automotive lubricant was studied using zeolite, kaolin and bentonite as adsorbents. The diameter of column was 1.5 inches. It was found that the optimum packing ratios between adsorbents and waste automotive lubricant were 868.05, 1041.67 and 1041.67 g/l for zeolite, kaolin and bentonite respectively, and the minimum height of adsorbent packing in the column was 4 inches.

Chemical analysis by GC - MS revealed that the automotive lubricant after refining consisted of hydrocarbons in the range of C_{17} - C_{32} similar to those found in the unused automotive lubricant. However, the automotive lubricant after refining contained no additives. Its viscosity decreased and its colour was in the range of the Thai Industrial Standard 1438 - 2540, *i.e.* less than No. 6.

Lead analysis using AAS revealed that the lead content in the waste automotive lubricant before refining was 1.70 ppm. No lead was found in the automotive lubricant after refining due to adsorption onto the adsorbents.

A feasibility study of recycling adsorbents by firing at high temperature found that the colour of the three adsorbents changed, their particle sizes increased and, hence, their surface areas decreased. Only zeolite and bentonite could be recycled, whereas kaolin lost its adsorbing property after recycling process. Properties of the automotive lubricant after refining by the recycled adsorbents were similar to those refined by fresh adsorbents. The results confirmed the possibility of recycling zeolite and bentonite in the one - step refining process of the waste automotive lubricant.