

NOTES

toxic manifestations because they were well tolerated upto the dose level of 1000 mg/kg, intraperitoneally in mice.

(b) Anti-tremor activity :

For anti-tremor activity, the albino mice of either sex weighing between 10–15 g were selected. For each compound five mice were chosen and gum-acacia suspension of the test compound was administered intraperitoneally. After 1 hr, tremorine hydrochloride (20 mg/kg, intraperitoneally) was injected. This dose of tremorinehydrochloride has been shown to produce tremors, salivation, akinesia and rigidity in mice. After ten minutes of tremorine injection, the mice were observed for the effects of tremorine. No significant anti-tremor activity was observed behaviourally. However, the compound nos. 4 and 5 showed mild central nervous depressant activity.

These compounds were also subjected for anti-convulsant activity but none of the compounds was found to protect the convulsion in mice induced by pentylenetetrazole (metrazole).

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Application of Thermographic Analysis in the Studies of Reclaimed Rubber Compounds. Effect of Sulphur, Stearic acid and Zinc oxide

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THE part played by reclaim in place of natural rubber in a compound has been previously reported¹. The present communication deals with the effects of (a) increasing the proportion of sulphur

and (b) stearic acid and zinc oxide in an accelerated reclaim compound.

Effect of Sulphur :

Table 1 represents the recipes of the compounds whose DTA thermograms are shown in Figure 1. The regions noted, in general, are (1) the T_m of the curative (here sulphur), being increasingly prominent with increasing proportion of sulphur, and (2) the curing region, followed by (3) a region at higher temperature, attributable to degradation and appearing in different shapes.

The thermogram characteristics of the curing exotherm indicate that the peak height is maximum in case of the compound containing the lowest amount (3 parts per 100 parts of rubber hydrocarbon) of sulphur (curve I), which when increased to 10 parts (curve II), the peak height sharply falls. No more appreciable change is observed on further addition of sulphur. When the fractional peak-areas^{2,3} (defined as the area enclosed by the initial base line, the rising portion of the curve upto the maximum height and the perpendicular drawn, from the maximum height to the initial base line) are compared, this area is also found to be greatest for the compound using 3 parts sulphur (curve I) and then the area decreases sharply on being transferred to the one containing 10 parts sulphur (curve II). Further increment in the quantity of sulphur does not bring any further significant change. With increasing proportion of sulphur initiation temperature (T_i) increases by a small extent whereas the peak temperature (T_p) is lowered; T_i and T_p respectively exhibit the maximum for the highest and the lowest proportion of sulphur. T_p in curve I is also remarkably different from that in other cases, where such difference is small. The slope of the peak with respect to the base line increases first slowly, then sharply, and finally slowly again as the amount of sulphur is increased upto 30 parts; above this proportion the slope value falls sharply. Compared to the other three systems, the ones containing 20 and 30 parts of sulphur show considerably higher slope values. Increment in the proportion of sulphur makes the curing exotherm gradually more sharp and distinct and brings about simultaneous changes in the shape of the thermogram in high temperature region (above 300°).

Effects of stearic acid and zinc oxide :

These are studied in both high- and low-sulphur compounds whose recipes are presented in Table 2

TABLE 1—FORMULATION OF COMPOUNDS* ANALYSED BY DTA

	I	II	III	IV	V
Reclaim	100.0	100.0	100.0	100.0	100.0
BA**	0.5	0.5	0.5	0.5	0.5
Sulphur	1.5	5.0	10.0	15.0	25.0

* Formulations are based on 50% hydrocarbon content of reclaim.

** Butylaldehyde aniline.

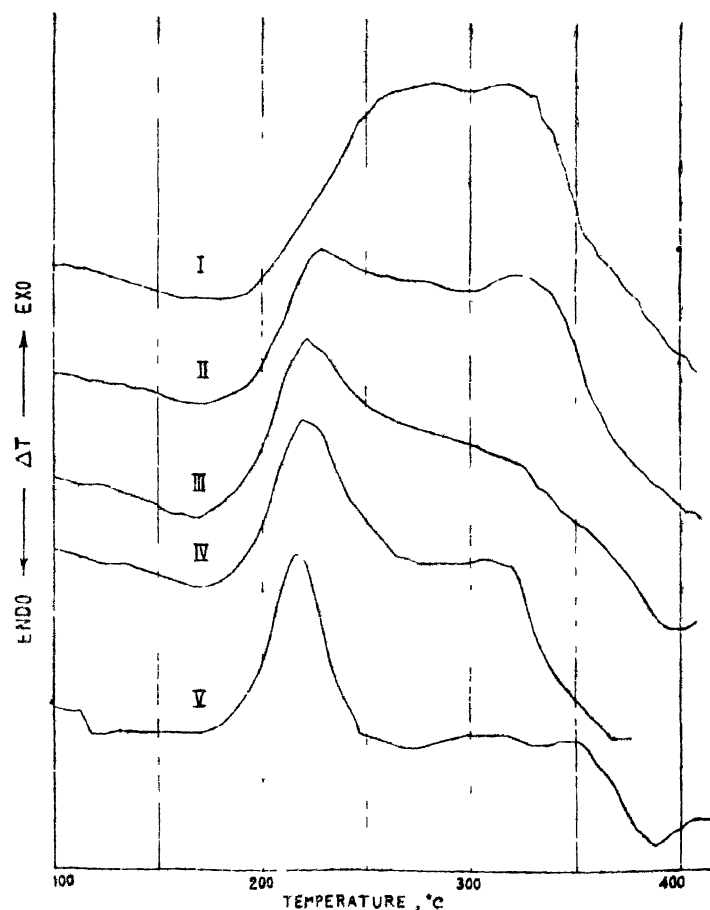


Fig. 1. Effect of increasing the proportion of sulphur in a reclaim compound.

TABLE 2—FORMULATION OF HIGH- AND LOW-SULPHUR COMPOUNDS* ANALYSED BY DTA

	High-Sulphur			Low-Sulphur		
	A	B	C	a	b	c
Reclaim	100.0	100.0	100.0	100.0	100.0	100.0
Stearic acid	—	0.5	0.5	—	0.5	0.5
Zinc oxide	—	—	2.5	—	—	2.5
BA	0.5	0.5	0.5	0.5	0.5	0.5
Sulphur	25.0	25.0	25.0	1.5	1.5	1.5

* Formulations are based on 50% hydrocarbon content of reclaim.

and their DTA thermograms are shown in Figure 2 and Figure 3 respectively. Curves A, B, C (Figure 2) and a, b, c ((Figure 3) represent respectively the high- and low-sulphur compounds in absence of stearic acid and zinc oxide, in presence of stearic acid, and in presence of both stearic acid and zinc oxide.

T_m of sulphur (monoclinic) is exhibited in the temperature range of 110°–120° in like fashions in the high-sulphur compounds (Figure 2) irrespective of the presence or absence of stearic acid and zinc oxide, but in low-sulphur compounds (Figure 3) the region for the T_m of sulphur, is not prominent and

is apparently broadened due to the overlapping of the T_m of stearic acid and zinc stearate (formed by

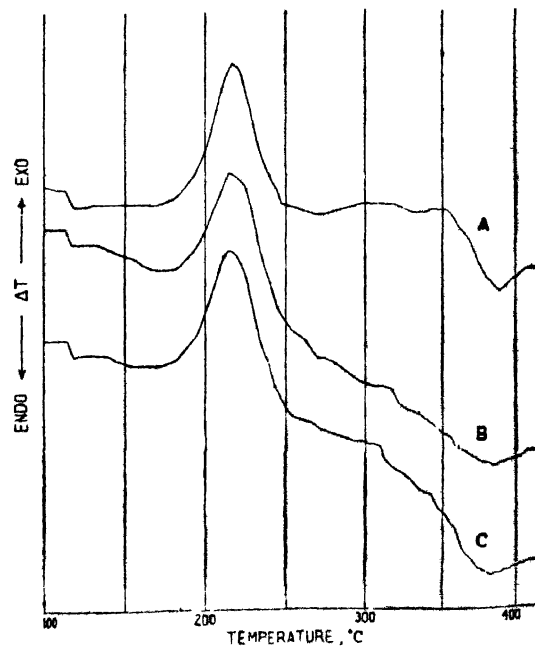


Fig. 2. Effect of stearic acid and zinc oxide in accelerated high-sulphur reclaim compounds.

heating of zinc oxide and stearic acid), when the latter materials are present. So far as the initial

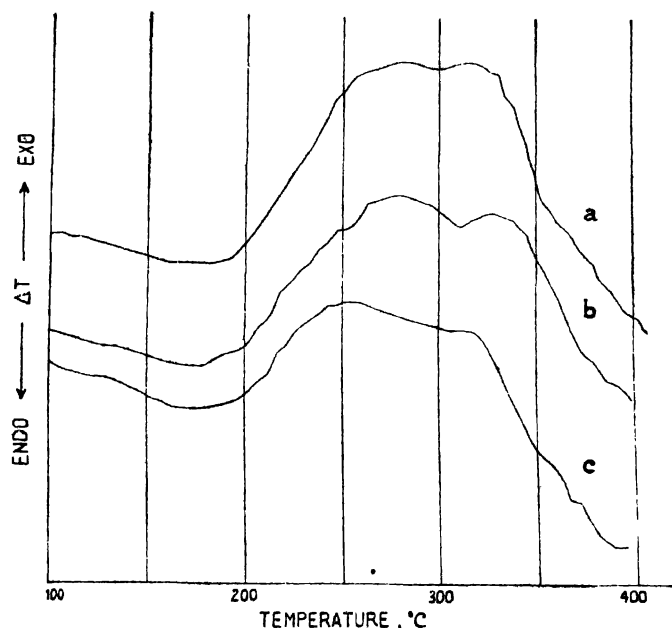


Fig. 3. Effect of stearic acid and zinc oxide in accelerated low-sulphur reclaim compounds.

exotherms (which not necessarily are solely due to curing) are concerned, on addition of stearic acid and then zinc oxide peak height decreases slowly and sharply respectively in high- and low- sulphur compounds. These peak height values in each of the three low-sulphur systems are much higher than those of the corresponding high- sulphur compounds. In low-sulphur compounds fractional peak area^{2,3}, as indicated above, diminishes by a small extent on addition of stearic acid and falls sharply when zinc oxide is also added, but in high-sulphur compounds such area does not show appreciable difference in presence or in absence of these additives. Also such areas in low-sulphur compounds are found to be greater than those of the corresponding high-sulphur systems. Differences observed either in the initiation temperatures (T_i) or in the peak temperatures (T_p) are not significant in presence or in absence of stearic acid and zinc oxide, in case of high-sulphur compounds. On the other hand, in low-sulphur compounds T_i at first decreases nominally on addition of stearic acid, but again increases on addition of zinc oxide along with stearic acid, whereas T_p , although does not show appreciable change on addition of stearic acid, falls sharply when zinc oxide is also added. T_i and T_p in each of the set of the three high-sulphur systems are, however, higher and lower respectively than those of the corresponding low-sulphur systems. Peak slope remains almost the same in presence or in absence of stearic acid and zinc oxide, but compared to the low-sulphur systems, the high-sulphur ones exhibit somewhat higher slope values.

Subsequent to the above initial exotherms the thermal patterns do not show significant characteristics in high-sulphur compounds, but in low-sulphur systems a secondary peak is observed, its sharpness gradually diminishing on addition of stearic acid and then zinc oxide.

Detailed works are in progress and will be published later on.

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Temperature Coefficient of E.M.F. of the Cell $\text{Co} | \text{Co-Soap(s)}, \text{K-Soap}, \text{Cu-Soap(s)} | \text{Cu}$ and the Entropy of Reactions

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IN spite of the fact that most of the heavy metal salts of higher fatty acids are insoluble in water, metal-metal soap electrodes have been little studied. Kolthoff and Johnson¹ employed a silver-silver laurate electrode for measuring laurate ion activity in aqueous solutions of potassium laurate. For quite some time we are engaged in carrying out