Chapter 6

CONCLUSIONS

Action of the phenolic antioxidants on polychloroprene based adhesives were studied. The resulting effects were due to the stabilizing ability of the phenolic antioxidants.

Work done indicated that the adhesives on ageing release a trace amount of acid. The phenolic antioxidant used were able to reduce the amount of acid released. Out of the three antioxidants used Wingstay L had the best stabilizing effect.

It was found the acid released led to the discolouration of the adhesive. Hence discolouration was minimized by the addition of the antioxidant.

Tests confirmed the acid released does not have a significant effect on the bond strength.

The tests showed that the viscosity increases with aging.

Polychloroprene based adhesives are normally multi-purpose adhesives. Hence release of acid can have adverse effects in the long run. Some materials that are bonded together are sensitive to acids. Therefore when these substrates are in contact with the adhesive (e.g. metal surfaces, fabrics) corrosion or the deterioration of the substrates can occur. The acid released will react with the iron in the container used to store the adhesives, bring about adverse effects. As time did not permit to carry on a detailed study about the influence of the released acid on the container it is suggested for future work. If the adhesive is used to bond to transparent materials or light coloured materials with time the joint will discolour and change the appearance of the object.

It is desirable to include an effective phenolic antioxidant in the composition. The amount of antioxidants incorporated into the formulation is two parts by weight per 100 parts by weight of chloroprene polymer.

It was found that fine grinding the resin and MgO before reacting with solvents increases the resistance to phasing. The maximum amount that could be incorporated into the mill mix was 6 parts by weight per100 parts by weight of polychloroprene polymer.

It was shown that incorporating a phenolic antioxidant into the formulation improves the stability of the adhesive with time and reduces the amount of acid released.

SUGGESTIONS FOR FUTURE WORK

The type of Polychloroprene used in the project is specified in chapter 2. Different types of polychloroprene available in the market could be used and observe the effect it has on the stability of the adhesive.

The resin used in the project is specified in chapter 2. It will be useful to carry out experiments using different types of resins and observing the effect it has on the amount of acid released.

The polychloroprene based adhesives on aging form a darker ring near the container wall. Initial experiments were carried out and identified that there is a reaction between the acid released and the container material. As time did not permit, further investigations were not carried out in this regard. Hence it will be useful to carry out further investigations in this matter and determine a suitable coating for the inner layer of the container or stress upon the use of an antioxidant in the formulation.

The phenoxy radical will abstract hydrogen from the antioxidant and stop the chain propagation. It will be useful to analyze the resulting products and confirm the antioxidant action.

Experiments should be carried out to identify the chemical products formed after aging in order to identify the best antioxidant to be used.

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