# CHAPTER V
# CONCLUSIONS

In this study, the effect of zinc soap prepared from *Jatropha curcas* oil, *Jatropha curcas* oil and paraffinic oil on cure characteristics, mechanical properties ageing properties of were investigated. The following conclusions can be drawn from the experimental results:

1. Incorporation of zinc soap in all rubbers, reduced the minimum torque, maximum torque, scorch time and cure time compared to control compound (without zinc soap) and the presence of zinc soap improved the processability of the rubber blends. Zinc soap increase on crosslink density measured by delta torque and decrease swelling.

2. In all rubbers studied, the tensile and tear strengths increased with increasing zinc soap optimum level are 5-7.5 phr. This enhancement in properties was attributed to strong interface interaction between rubber and the filler matrix. The swelling ratio of rubber blends with zinc soap as a result of better dispersion of the rubber matrix.

3. The key aspect of the rubber production is an efficient degradation and thermal ageing of zinc soap. Therefore, that the compositions retain their tensile strength which is a hint for their not good thermal oxidative stability. Among the crosslinked systems, the zinc soap crosslinked ones exhibit high stability according to the retention of tensile strength. On the other hand, the EB values are considerably reduced as a result of the thermal ageing.

4. SEM studies revealed that the rubber-filler interaction played a strong role in determining the failure mechanism of the vulcanizates as a result of zinc soap incorporation but also due to better filler dispersion.

5. Incorporation of *Jatropha curcas* oil on cure characteristics of the blends indicated that substitution of the above ingredients *Jatropha curcas* oil did not affect the cure properties when compared conventional oil. A significant decrease in