CHAPTER V
CONCLUSIONS

In this research, it was demonstrated that the physico-mechanical properties of various filled-NR compounds increased with increasing surface area of fillers. The carbon black-filled NR compounds exhibited higher tensile strength, modulus, hardness and abrasion resistance than those of gypsum- filled and silica-filled NR compounds because the latters are lack of interaction between inorganic filler and NR molecules. On the other hand, high surface area silica-filled NR compounds illustrated higher elongation at break than that of carbon black-filled NR compounds suggesting that there are less pseudo-crosslink points. Gypsum-filled NR compounds gave moderate physico-mechanical properties between carbon black-filled and silica-filled NR compounds. Furthermore, the partial replacement of carbon black with gypsum and silica-filled NR compounds significantly reduced tan δ, heat build up and rolling resistance indicating a direct function of gypsum and silica loading. For another aspect, water in gypsum and silica can play an important role to reduce heat build up and soften these inorganic filler so that modulus and hardness of their NR compounds reduce. However, it is clearly seen that water attached firmly in gypsum shows more effective role to reduce heat build up and mildly lower modulus than loosed water in silica.