

Rheological Characterization of Rejuvenated Asphalt Binders

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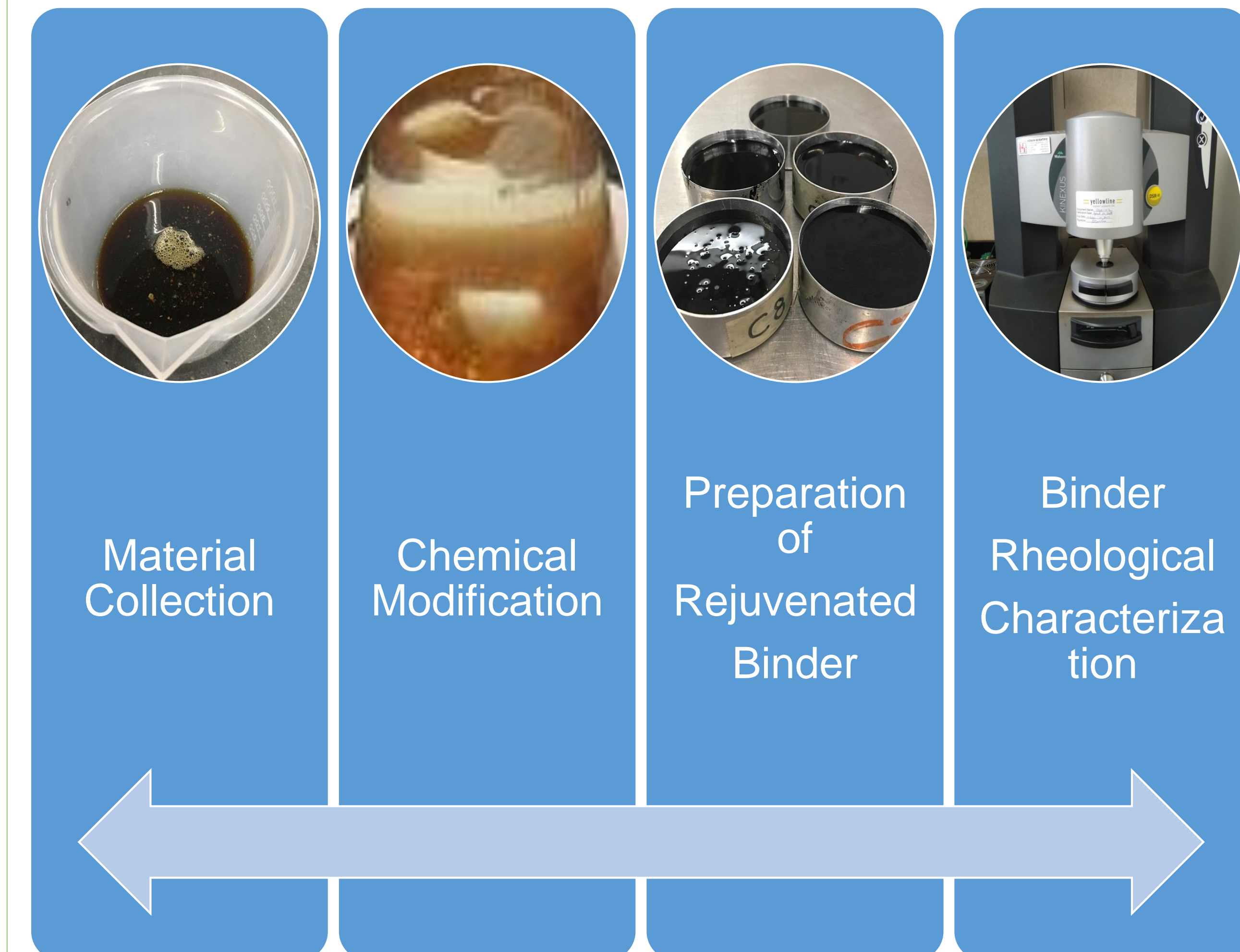
INTRODUCTION

- Using Reclaimed Asphalt Pavement (RAP) in pavement construction is a sustainable approach
- Oxidation of RAP binder leads to the pavement distresses and alters the rheological properties
- Aging of binder accelerates the thermal cracking of pavement in cold regions
- Rejuvenators are mixed with RAP binder to improve binder rheology and performances

OBJECTIVES

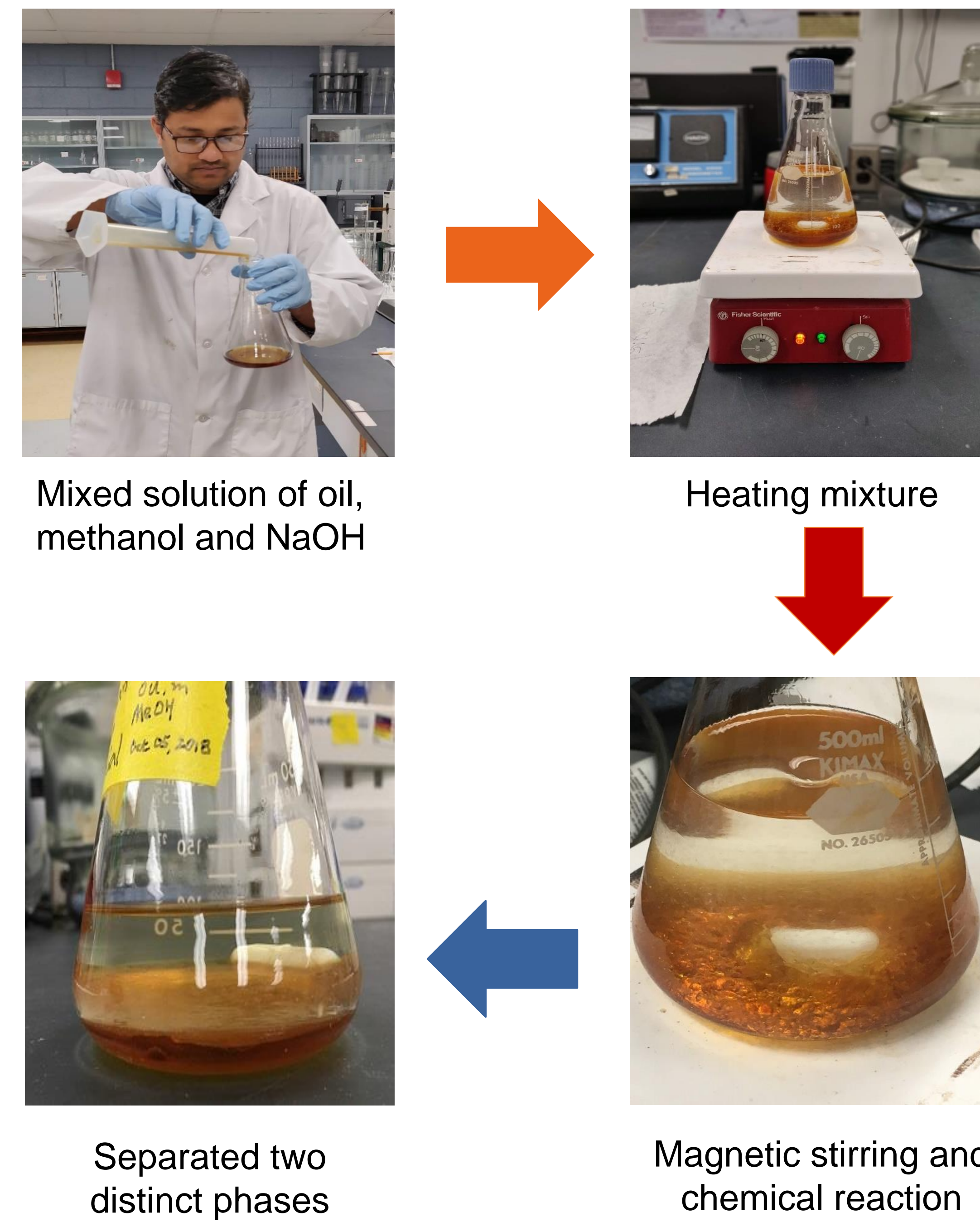
- Observe the effect of aging and rejuvenation on asphalt binder rheology and chemistry
- Evaluate the impact of rejuvenators on asphalt binder rheology

RESEARCH PLAN



LABORATORY WORKS

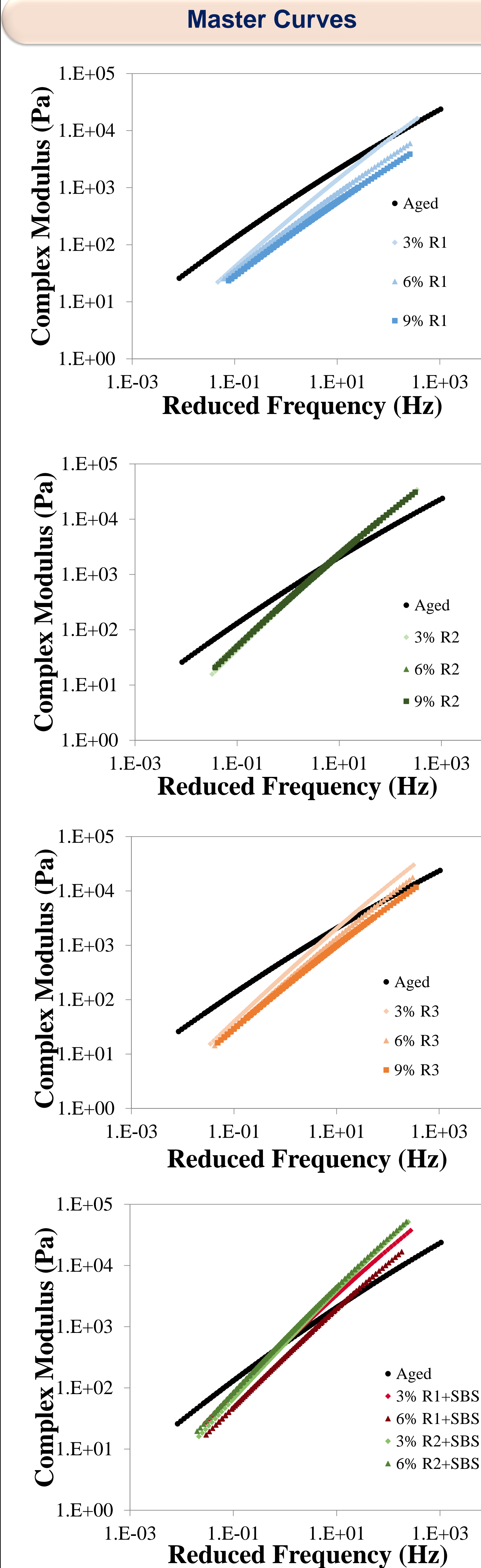
Chemical Modification



Materials Tested

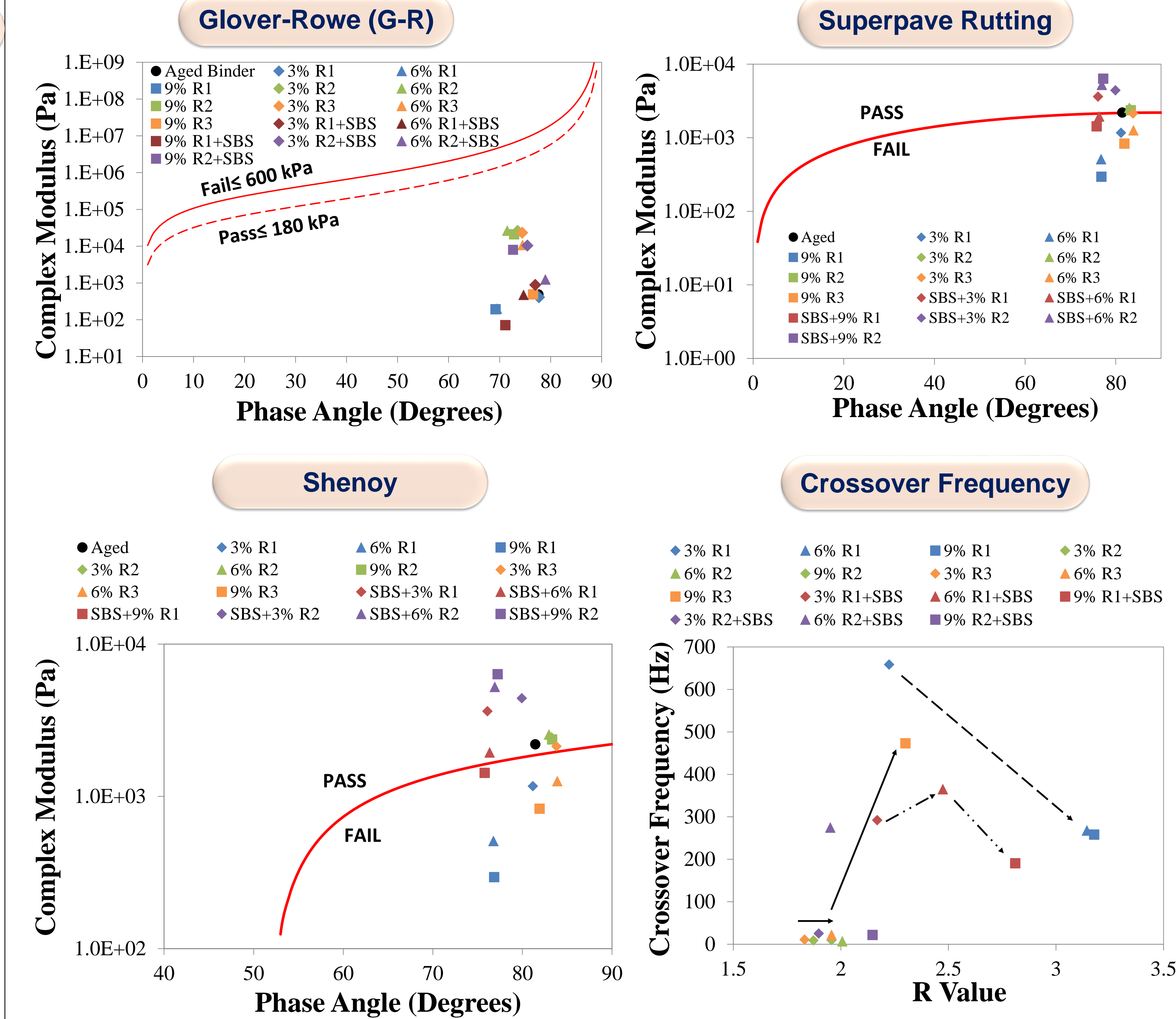


Dynamic Shear Rheometer Summary

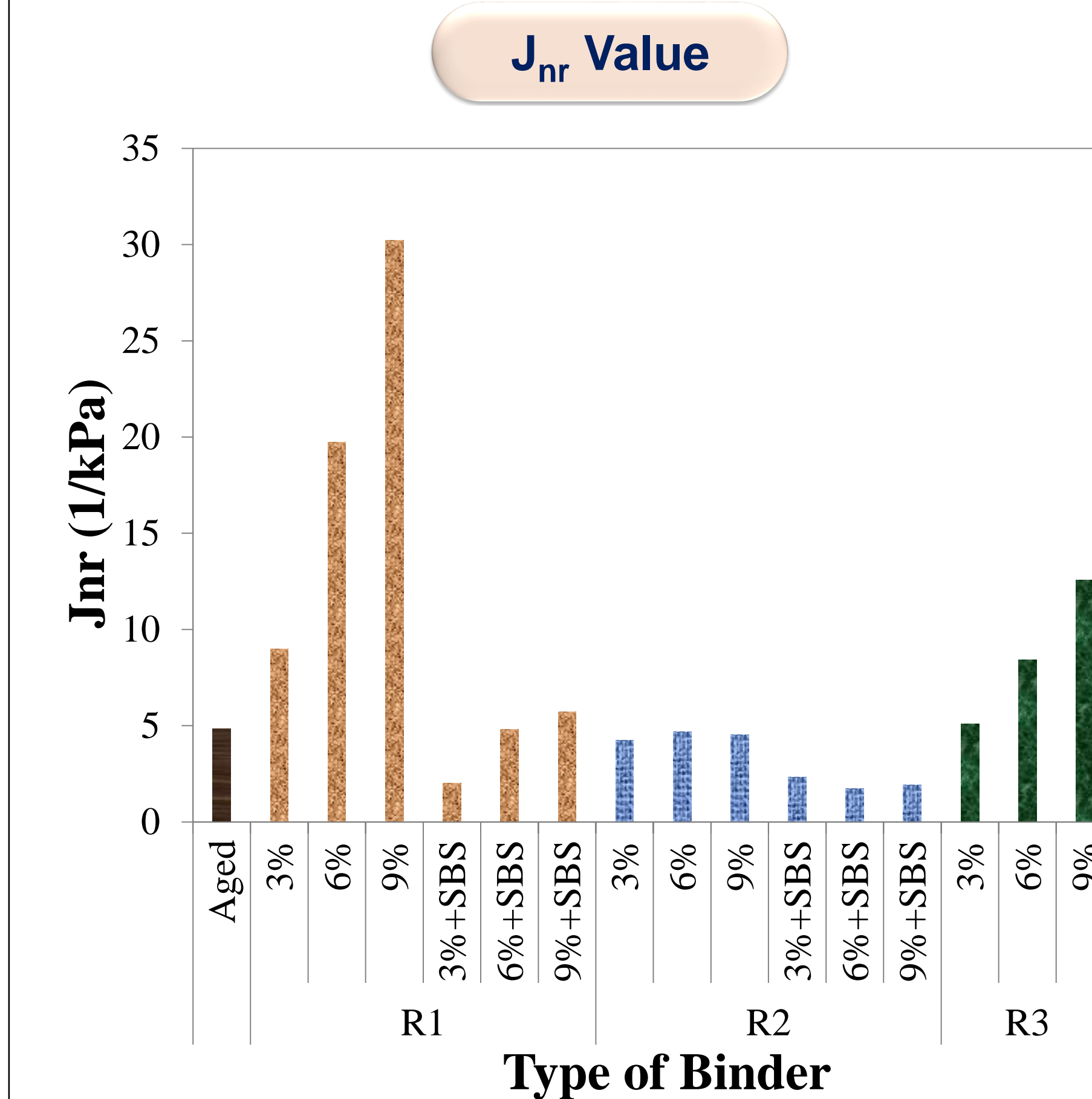


RESULTS

Rheological Parameters



MSCR Summary



CONCLUSIONS

- Rejuvenation reduces the stiffness of aged binder except 6%R2. The stiffness can be ranked as R2>R3>R1.
- Rejuvenation increases the fatigue cracking resistance of aged binder.
- Rutting resistance decreased with the increasing rejuvenator dosages. This drawback can be addressed using SBS polymer.
- Comparing the J_{nr} criteria, R2 rejuvenated binder showed good performances and met the traffic loading criteria.