

## Development of Biochar-Based Sustainable Corrosion-Resistant Coating

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### INTRODUCTION & AIM

#### Introduction:

Coating technology involves the application of a thin layer of material onto a substrate to enhance its surface properties, including protection, functionality, and aesthetics. Coatings can be made from various materials such as polymers, pigments, additives, and solvents, depending on the intended application. The conventional raw materials are mostly petroleum based and has adverse effect on environment.

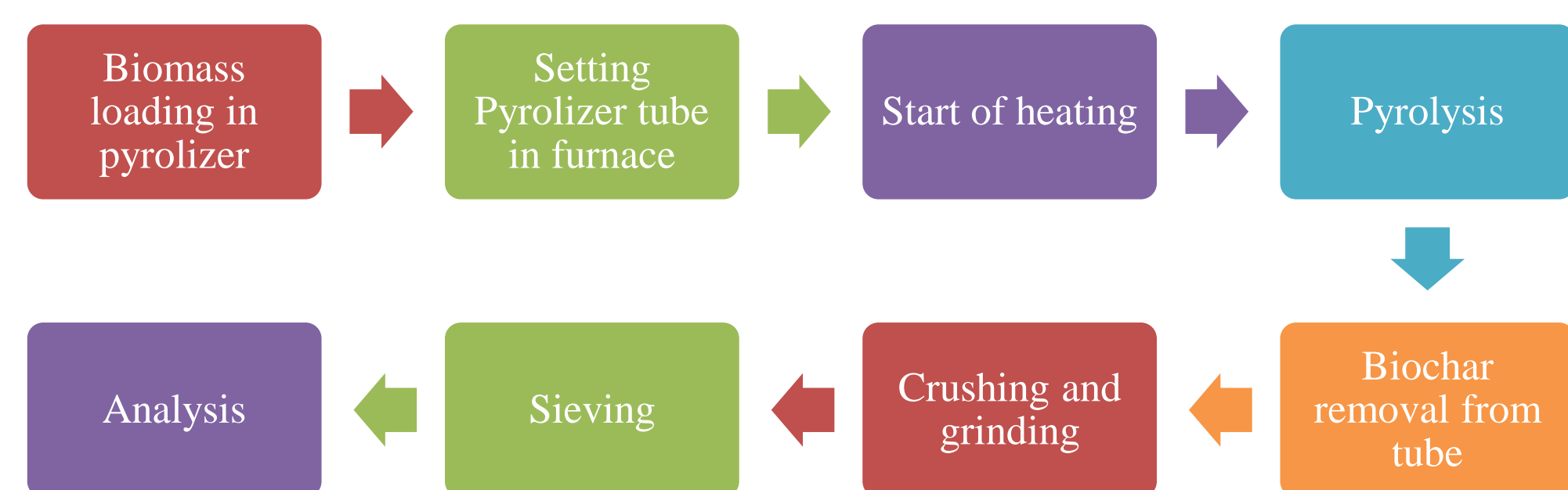
The development of sustainable coating technologies is essential to addressing environmental, economic, and social challenges associated with conventional coatings. Thus Biochar, derived from biomass via pyrolysis, offers high thermal stability and chemical inertness, making it effective in corrosion protection. When biochar incorporated into coatings it forms a protective barrier that prevents the diffusion of corrosive agents and enhances durability.

#### Aim/Objectives:

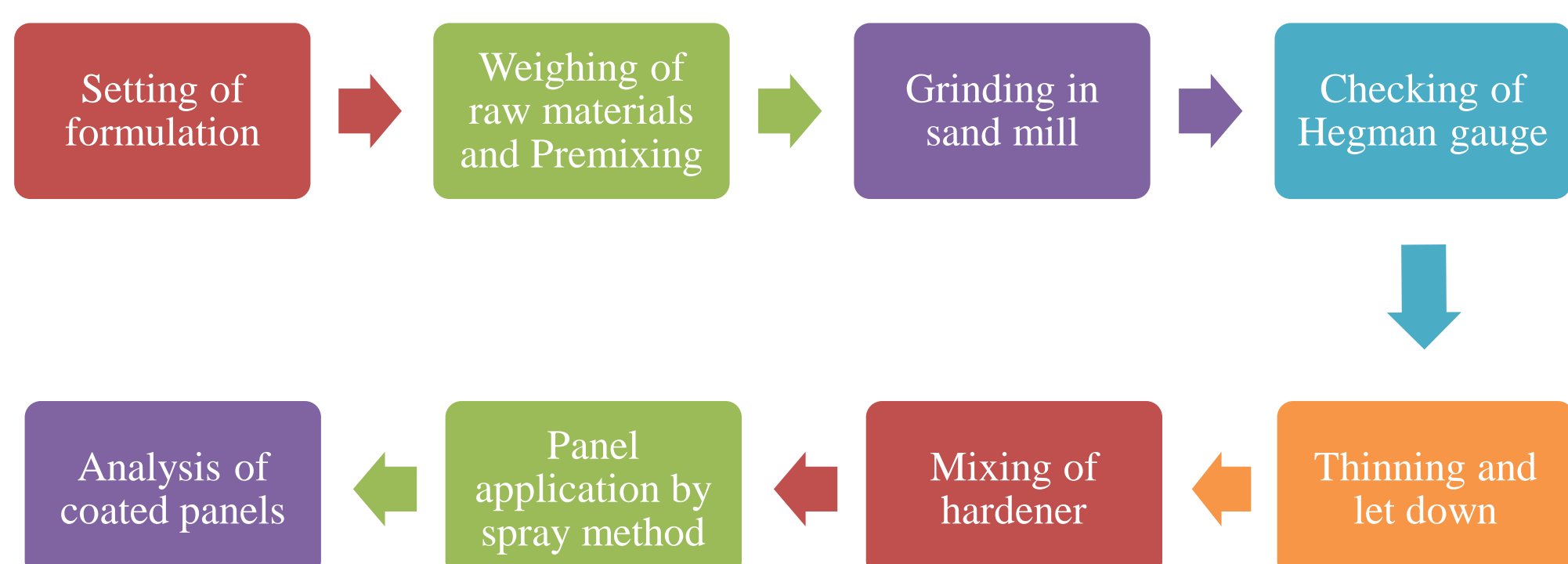
1. Prepare a biochar from natural biomass at different pyrolysis parameters.
2. Characterization of prepared biochar.
3. Study the effect of biochar on performance of coating.

### METHOD

#### Biochar Synthesis:



#### Coating Synthesis:



#### Test Methods:

Gloss: ASTM D523

Flexibility: ASTM D522

Adhesion: ASTM D3359

Pencil Hardness: ASTM D3363

Scratch Resistance: ASTM D2197

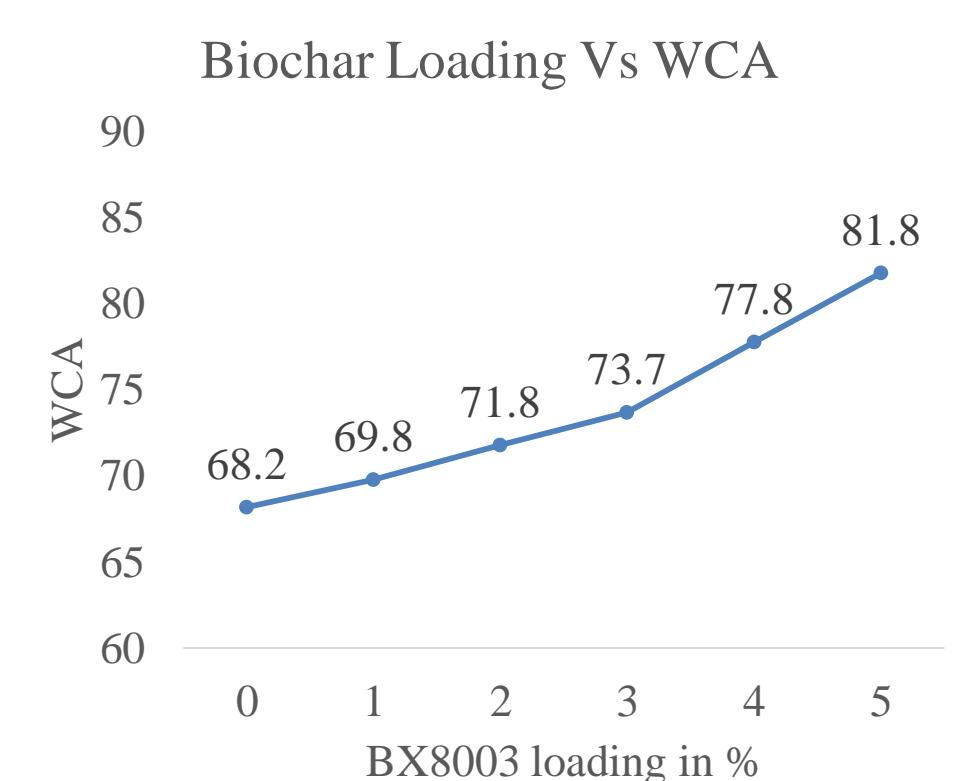
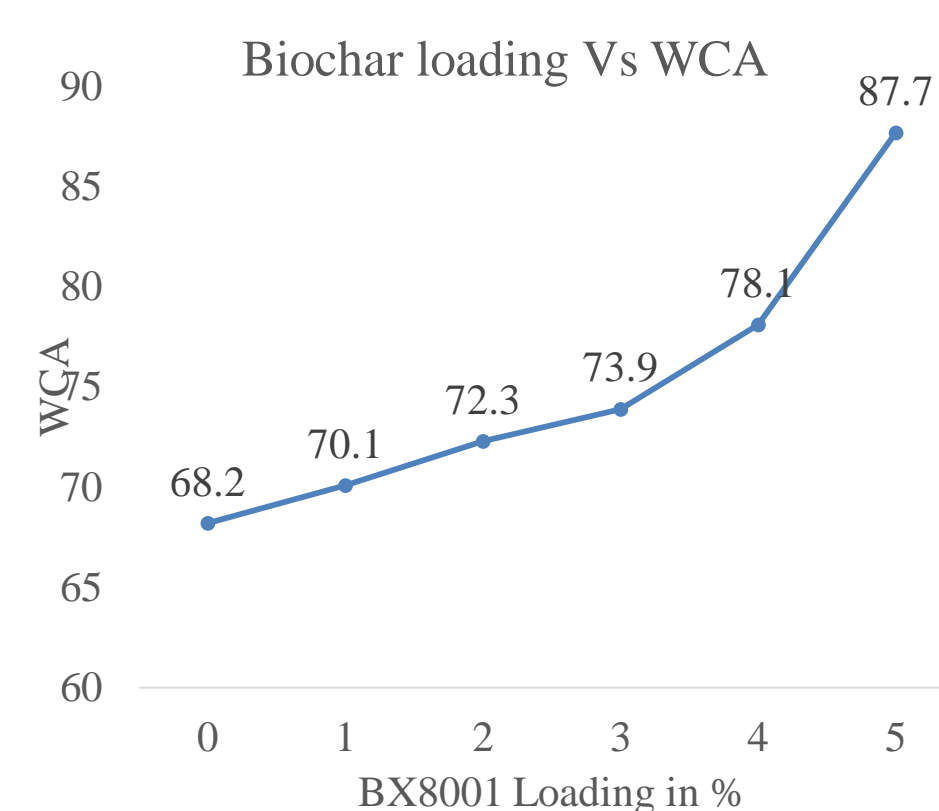
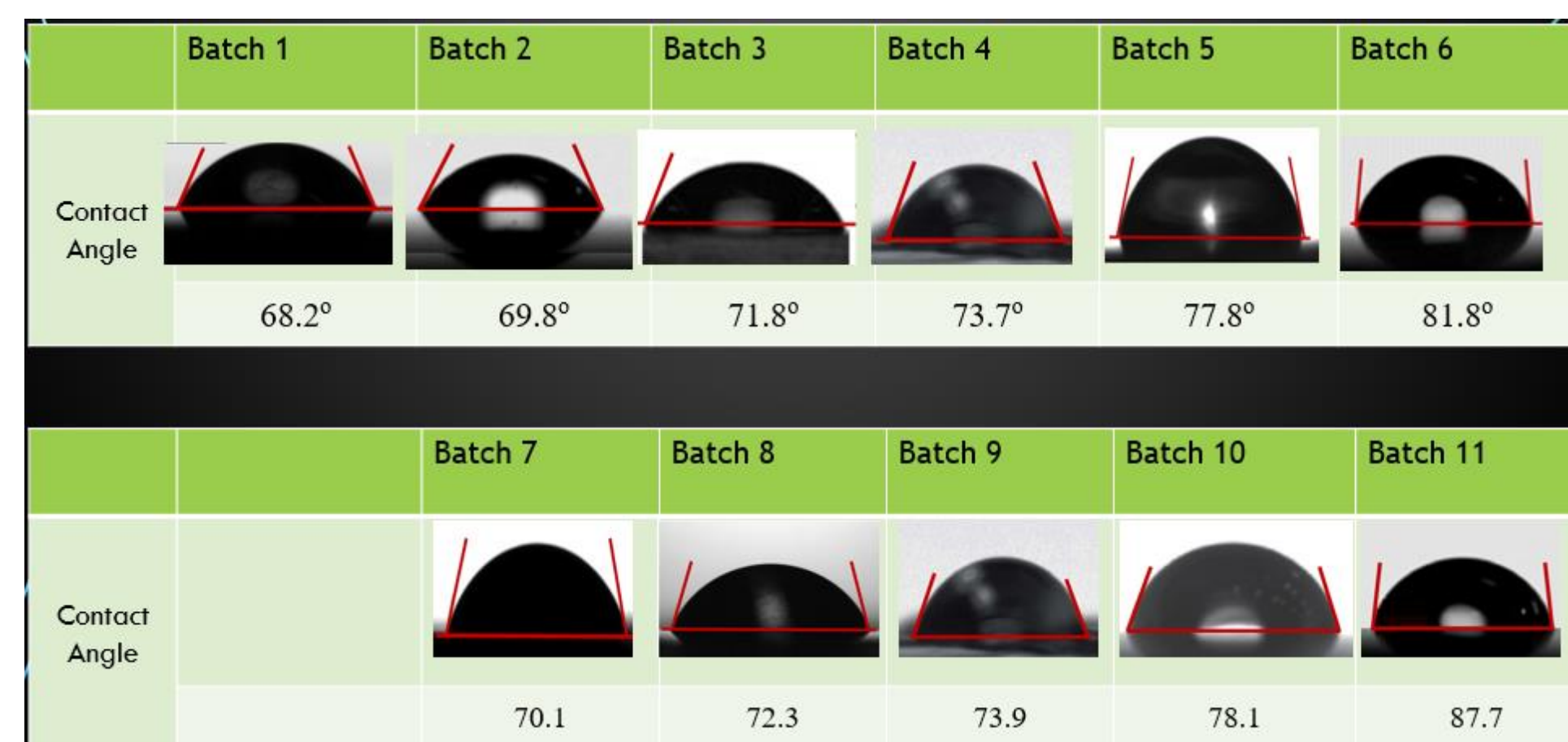
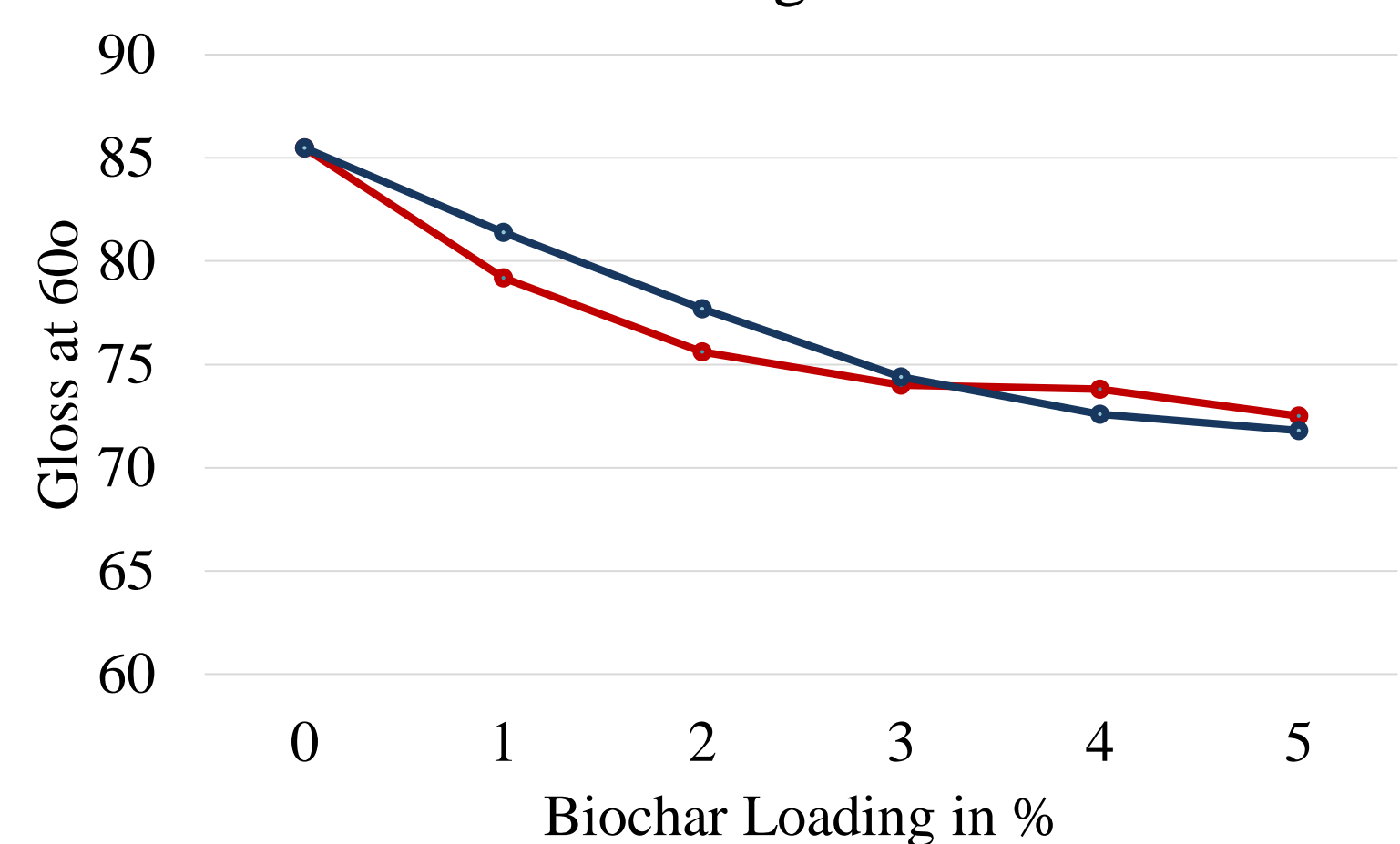
Dry Film Thickness: ASTM D7091

Acid, Alkali, Water Resistance: ASTM D1308

Solvent Rub Resistance: ASTM D4752, D5402

### RESULTS & DISCUSSION

Biochar Loading Vs Gloss



### CONCLUSION

1. Incorporation of biochar can be used in coating formulation.
2. Incorporation of coating does not affects the fundamental properties of coating.
3. Incorporation of biochar can increase the hydrophobicity in the coating
4. Biochar prepared at long duration shows more hydrophobicity than shorter.

### FUTURE WORK / REFERENCES

1. Biochar from different biomasses can be synthesis to evaluate its performance in the coating.
2. Surface modification of biochar can be made to enhance the properties of coatings.
3. Applications field biochar based coating need to explore.