

3.1 Motivation for Research

- High failure rates were observed in power plant boiler components operating at high temperature fabricated using SMAW welding consumables.
- Developing SMAW electrode to enhance the mechanical properties and hot corrosion performance of the welds.
- The information in terms of coating composition about welding electrode presently used in this application is classified and limitedly available in the public domain.

3.2 Research objectives

- To develop highly basic shielded metal arc welding electrode coatings for weld joint used in power plant applications using highly basic $\text{CaO-CaF}_2\text{-SiO}_2\text{-Al}_2\text{O}_3$ flux system.
- Characterization of electrode coatings: physicochemical, thermophysical, structural and wettability properties.
- Mechanical, microstructural and high temperature corrosion investigations on the fabricated dissimilar metal welds.
- Comparison and assessment of developed electrode coatings with the commercially available electrodes.

3.3 Research plan

The schematic of the present investigation is presented in Figure 3.1.

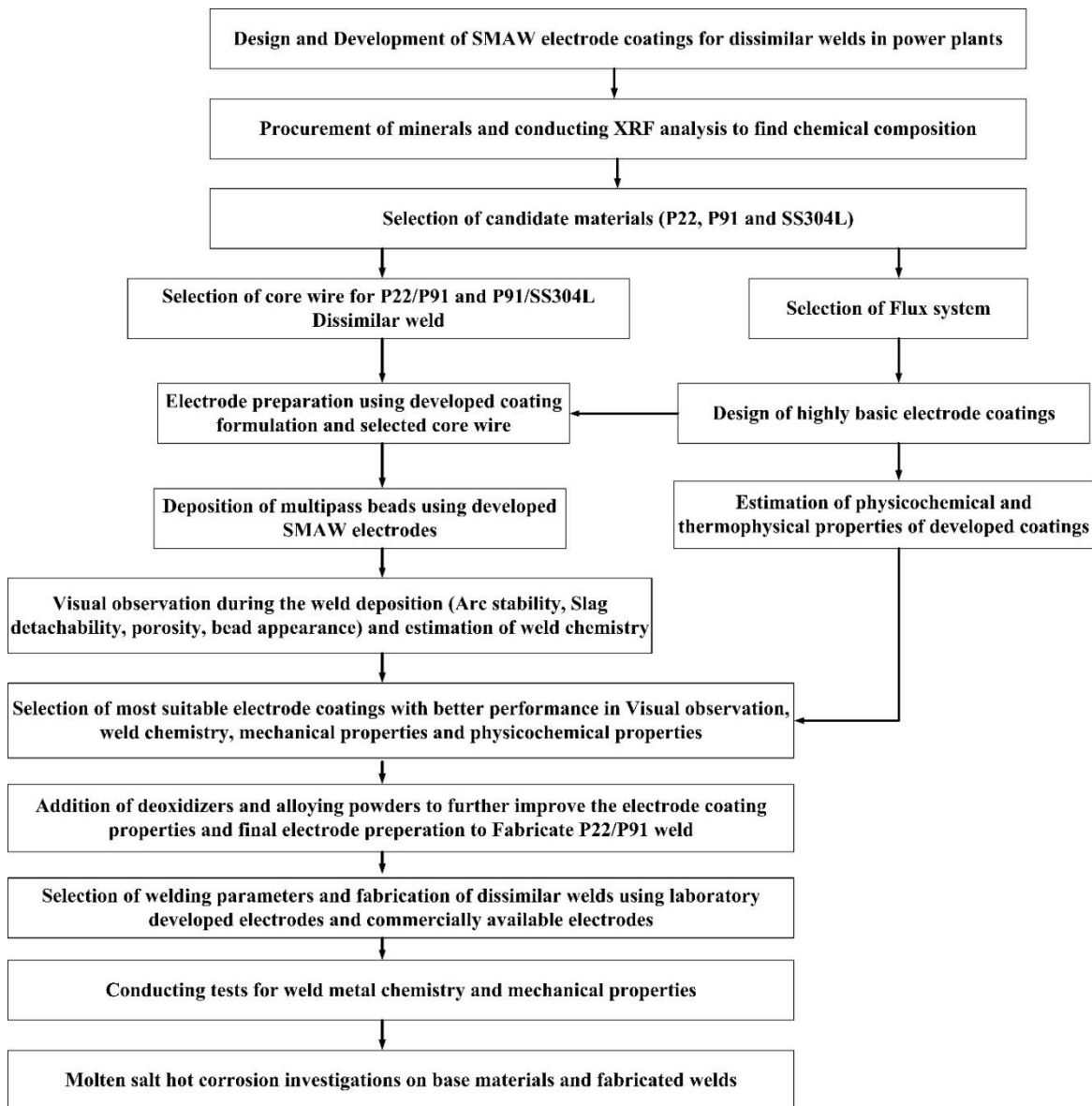


Figure 3.1: Flow chart of the present investigations