

CORROSION TESTS OF MATERIALS IN HEAVY LIQUID METALS (Pb, Pb-Bi, Pb-Li)

Innovations and Benefits - The following activities can be performed in the Lead Chemistry Laboratory RACHEL (Reactions and Advanced Chemistry for Lead):

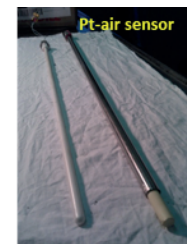
- Corrosion tests of steels, bare and/or with coatings, in liquid metals (Pb, Pb-Bi, Pb-Li alloy) in oxygen-controlled environment inside dedicated experimental steel capsules.
- Manufacturing, calibration and R&D of potentiometric sensors for the oxygen detection in liquid metals (Pb, Pb-Bi) .
- R&D on oxygen control systems for liquid metals (Pb, Pb-Bi) with gas-phase (H₂, O₂) and solid-phase (oxygen getters) methods.
- Support, development and implementation of oxygen control and monitoring systems for experimental facilities working with liquid metals (Pb, Pb-Bi).

Uses -

- Study of the corrosion behavior of steels with and/or without coatings in liquid metals (Pb, Pb-Bi, Pb-Li) in different experimental conditions (temperature range 400-550°C, various oxygen concentrations).
- Determination of the oxygen concentration dissolved in liquid metals with potentiometric sensors (Pb, Pb-Bi and other liquid metals in principle).
- Support for the development and implementation of an oxygen control and monitoring system in experimental facilities working with liquid metals.

Past and Present Activities -

- Exposure tests in liquid Pb of bare and coated steels (T91, AISI 316L and 15-15Ti) at 480°C and 550°C with different oxygen contents.
- Exposure tests in liquid Pb-Li of bare and coated steels (ferritic/martensitic EUROFER) at 550°C.
- R&D on potentiometric oxygen sensors for liquid metals, with particular focus on the reference electrode.
- Study of the control of the oxygen concentration in liquid Pb and Pb-Bi with Ar-H₂ and Ar-air gas mixtures.
- Study of the control of the oxygen concentration in liquid Pb with oxygen getter materials (e.g. Ti, Zr, Ta and Mg) at different temperatures.
- Implementation of an oxygen control and monitoring system on experimental facilities working with Pb and Pb-Bi fluids.



Characteristics:

CUSTOM The service can be adapted with flexibility according to different contexts and needs