

4-30-2003

Developing A Sensing System for the Measurement of Oxygen Concentration in Liquid Pb-Bi Eutectic: Quarterly Progress Report (Feb. 01 – Apr. 30, 2003)

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Repository Citation

Jiang, Y., Fu, B., Yim, W. (2003). Developing A Sensing System for the Measurement of Oxygen Concentration in Liquid Pb-Bi Eutectic: Quarterly Progress Report (Feb. 01 – Apr. 30, 2003). 1-3. Available at: https://digitalscholarship.unlv.edu/hrc_trp_sciences_materials/94

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Quarterly Progress Report
(Feb. 01 – Apr. 30, 2003)

**Developing A Sensing System for the Measurement of Oxygen
Concentration in Liquid Pb-Bi Eutectic**

Principle Investigators:

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Developing A Sensing System for the Measurement of Oxygen Concentration in Liquid Pb-Bi Eutectic

Introduction

We received most of the components, everything except the customized and outsourced stirrer, for the new apparatus for oxygen measurement/calibration. Thus far, most of the machining work has been completed. The LaveView module used for the data collection and the control of the apparatus has been tested. 2-D simulation work has been performed using FEMLAB.

Personnel

Principal Investigators:

- Dr. Yingtao Jiang (Electrical and Computer Engineering)
- Dr. Bingmei Fu (Mechanical Engineering)
- Dr. Woosoon Yim (Mechanical Engineering)

Students:

- Mr. Xiaolong Wu, Graduate Student, (Electrical and Computer Engineering)
- Mr. Bin Chen, Graduate Student, (Mechanical Engineering)
- Mr. Ramkumar Bhavani Sivaraman (Electrical and Computer Engineering) (On TA)
- Ms. Yi Lu, Graduate Student, (Electrical and Computer Engineering)

Management Progress

- Expenditures incurred during this quarter are within the target amount allocated.

Management Problems

Some delays have been experienced when dealing with the stirrer manufacturer.

Technical Progress

- One paper regarding the new experimental setup is submitted to AccApp'03.
- We ran FEMLAB to do simulations for oxygen concentration distributions in our setup due to stirring. 2-D case in our design was successfully performed.
- We have finished most of the machining work of the new apparatus.

Technical Difficulties

- The memory overflow problems remained once we move to 3-D FEMLAB simulations. FEMLAB is not adequate for our purpose.

- The delayed shipment of the stirrer from the manufacturer has become a serious problem. We are actively contacting the manufacturer to resolve this problem.

Plans for the Next Quarter

- Finish the assembly of the apparatus.
- Get the safety plan approved.
- Move the apparatus to the assigned lab in HRC, once the safety plan is approved.
- Operate and calibrate our new apparatus with the assistance from Dr. Wei Hang from LANL. His visit to the UNLV campus is scheduled to be some time in June.
- More sophisticated software FLUENT and more powerful UNIX-based Sun workstation needed to be purchased