



Development of Contact Resistance Measurement Capability and Application to New Photovoltaic Materials

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Introduction

Motivation for designing and testing an in-house contact resistance measurement system. We are interested in so our research efforts to measure and optimize the contact resistance of photovoltaic devices are being developed using thin film semiconductors such as WSe₂. We are interested in the contact resistance of the device. The desired electrical contact on a semiconductor device is a low resistance ohmic contact. The only way to evaluate and optimize the contact resistance is through measurement.

Background

Preparation

- The process to prepare a contact resistance measurement has many steps and refining these steps has consumed the bulk of the time for this project.
- The steps are: Deposit a film, imprint a photoresist pattern, develop the photoresist, etch the metal, and finally remove photoresist.
- The photolithography process is in Figure 5 and the photoresist on Si is in Figure 6.
- After all of the preparation has been completed a set TLM contact resistance measurements are made.

Results



Isolation of Methanogens Capable of Utilizing Solid-Phase Carbonate Minerals

Robert A. Hargrett-Anderson, Donald Poff, and Karin A. Weber



Results (continued)



Figure 4. The first photo with legend with a red box. The second photo with legend with a red box. The third photo with legend with a red box. The fourth photo with legend with a red box. The fifth photo with legend with a red box. The sixth photo with legend with a red box. The seventh photo with legend with a red box. The eighth photo with legend with a red box. The ninth photo with legend with a red box. The tenth photo with legend with a red box.

Sample Name	Depth	Temperature (°C)	pH	Salinity (ppt)	Redox Potential (mV)
Sample 1	10 cm	35	7.5	10	-100
Sample 2	20 cm	35	7.5	10	-100
Sample 3	30 cm	35	7.5	10	-100
Sample 4	40 cm	35	7.5	10	-100
Sample 5	50 cm	35	7.5	10	-100

Figure 5. CH₄ concentrations after PCR work (see Fig. 1). The first row shows the results for the new isolation work, along with a positive control and three different negative controls. The other control will show that the right incubation followed by the quantitative, qPCR work.

Figure 6. CH₄ concentrations after PCR work (see Fig. 1). The first row shows the results for the new isolation work, along with a positive control and three different negative controls. The other control will show that the right incubation followed by the quantitative, qPCR work.