CdTe/CdS solar cells on Soda-Lime Glass



Scanning Electron Microscope (SEM) photo of the CdTe film surface morphology



I-V charteristic of a CdTe solar cell. The characteristic of the solar cell is taken under a simulated AM 1.5 mW/cm2 solar light **Best efficiency of 15.8% is obtained**

Principal Innovation

- . A new way of depositing CdS, namely *sputtering in presence of CHF*₃ (*better reproducibility*)
- By using a gas such as CHF_2Cl instead of $CdCl_2$ for treating CdTe (Elimination of $CdCl_2$ deposition chamber)
- *Eliminating the CdTe etching step* from the production process (quicker process, less safety problems)
- Developing *a new ohmic and stable contact* for *p*-type CdTe (Sb₂Te₃, As₂Te₃)

The Chlorine treatment

- . Treatment of CdTe/CdS thin film structures in Argon atmosphere containing 10% of Freon gas at 380°C to 440°C for few minutes promotes micro-structural changes in the CdTe film structure similar to that obtained with CdCl₂ treatment.
- The use of Freon gas offers advantages with respect to $CdCl_2$ vapor generation since the problem of Cd toxicity due to the $CdCl_2$ handling is eliminated.
- The Cl₂-treatment can be made with any gas of the Freon family. The only need is that the gas contains chlorine.
- Even if Chlorofluorocarbons are considered dangerous for the ozone layer surrounding the Earth, they could be used in an industrial process being easily recoverable in a closedcircuit plant without any pollutant emission in the earth atmosphere.