Ke ords: \mathbb{R} ends: \mathbb{R} in spectroscopy; Sputtering; \mathbb{R} in \mathbb{R} in \mathbb{R} in \mathbb{R} in films thin films that films the films thin films that \mathbb{R} is the films thin films that \mathbb{R} is the fil ing thinexiblelms for brittle crystalline or amorphous materials opens up possibilities for low cost andversatile sources of energy conversion.Nevertheless, organic materials currently remain complimentary materials for semiconductor devices rather than competitive primarily due to poor eciency and low charge mobility. Agreatvariety of organic molecules have been identied that can be used as self-assembled-monolayers(SAMs). S some of the contain carboxylategroups S (24) \sim 24

1. Introductionchanging chemicalgroups in the molecule. Also, substitut-

 \overline{C} \rightarrow $\overline{1}$. \rightarrow $\overline{1}$ +1 330 $\overline{2}$ 145, \rightarrow $\overline{1}$ 330 $\overline{1}$ 1. E-mail address: $r = r$ is represented (R.R. Mallik).

- developed by Hu \mathcal{F}_1 , the subset compounds, the subset of \mathcal{F}_2 atoms are conveniently sitting at the end of a tripod which allows the molecules to adsorb on \mathcal{A} ing gold. \Box , i (i) \Box C cds, are ii) ii) \Box tor materials for thin-films photovoltaic devices and have **band gaps in the range 1.4–1.5** eV. The range materials can materi be used also for the fabrication of hybrid heterojunctions. The presence of organic layers in heterojunctions tends to improve surface surface surface surface surface surface surface surface \mathbf{h} for light conversion \mathcal{Y} . But the problem of the problem of the contact of the co resistance between semiconductors layer and metal elec t_1 , t_2 , t_3 , t_1 , t_2 In the present work we present work we present adsorp-
- $\begin{array}{rcl} t & t & t & t & t \\ t & -t & t & t \\ t & -t & -t & -t \end{array}$

3. Results and discussion

3.1. Cond c ion mechanisms

2.3. IETS meas remen

2.4. MRAIRS

assume that, at low voltages and temperatures, direct tunneling will be the dominant mechanism. Indeed, for direct

and LUMO levels are participating in creating conduction channels. The strength of the coupling between molecular orbitals and surface states depends on their mutual location. The greater the energy separation of the levels the smaller interaction will be.

3.2. Model barrier parame ers calc la ions

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 $\varphi(x, V) = \varphi_3 - (x/d + s)V$ d < x \le ss.

$()$ $Al/CdS/Pb$:

 φ DTJ /F11 1 Tf -2.3957 -2.0657 TDTD (Tj /F1 1 Tf 6.)Tj /44/t6f 1.3373 0 TD

3.3. IET, IR, and calc la ed spec ra

1.3 1.2 1.1 1.0 **Voltage,V** 1.6 1.5 **Conductan ce (normalized)** 1.4 Fig. 8. Normalized conductance–voltagedependencerecorded at 771 K for an Al/CdS/7ETTD/Pb tunneljunction (symbols),and WKBapproximationfit 0 1202220232024202 Fig. 9.Control IET spectra obtained from (a) Al/CdS/Pb, (b) Al/CdS/ -0.2-0.15-0.1-0.0500.050.167350.2 solvent/Pb, and (c) Al/alumina/solvent/Pb junctions.I. Dolog et al. / Surface Science 602 (2206) 2.97–2.99 to thedata(solid line). 2.97 **cm-1Intensity (arbitrar y units)**(a)(b)(c)

Fig. 9 shows control IET spectra obtained from (a) Al/ CdS/Pb, (b) Al/CdS/solvent/Pb, and (c) Al/alumina/solvent/Pb junctions which display no evidence of significant contamination. The control spectrum (a) is presented to illustrate peaks normally seen for CdS samples and there is some evidence of Al–O in the spectrum at 980 cm¹ . Peaks due to CdS appear as a shoulder at 1110 cm¹

