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# Real time investigation of the interface between P3HT:PCBM layer and Al electrode during thermal annealing

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Real time variation of the interfacial structure between Al electrode and P3HT:PCBM thin film during thermal annealing has been investigated using synchrotron x-rays. We found that Al atoms diffuse into the organic layer to form a thin interlayer between Al electrode and the organic layer even during the deposition of Al layer. The interlayer thickness and the mass density of the interlayer increased if annealed above 120°C. The interlayer thickness depends on annealing processes and the inter diffusion is accelerated by a fast annealing process. The Al diffusion disturbs the preferred alignment of the (100) direction of the P3HT crystals along the surface normal direction and randomizes the orientation of P3HT crystals. The Al diffusion also helps to reduce the contact resistance in the P3HT:PCBM based solar cells.