**UNIVERSITÉ BLAISE PASCAL**
U.F.R de Recherche Scientifique et Technique

***CYCLE DE CONFÉRENCES DE CHIMIE***

***Avec le concours de :*** ***Manufacture Française des Pneumatiques MICHELIN***
***Centre de Développement Préclinique, Schering-Plough***
***Fédération de Chimie (FR 2404)***
***Section Auvergne de la Société Française de Chimie***
***U.F.R.S.T. / Master de Chimie / Département de Chimie***

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# Mercredi 10 Mars 2010 à 16 h
# Amphi de Chimie Paul REMI - (Site des Cézeaux)

# Dr Roger C. Hiorns

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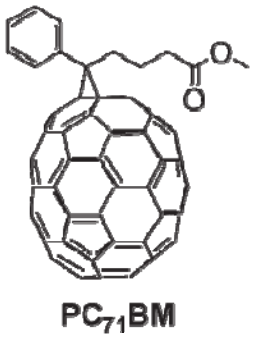
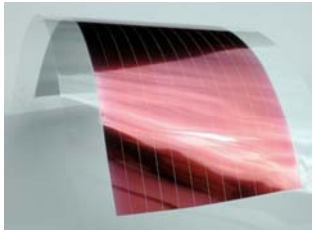
## Organic solar cells and fullerene: making wires from spheres

Fullerenes have been essential to the development of polymer-based photovoltaics since the first such devices were made. Now in its modified form as phenyl $C_{71}$ butyric acid methyl ester ($PC_{71}BM$, Figure 1), efficiencies of around 7 % have been obtained.[2] This has been due to combination of its electronic properties, solubility and morphological behaviour in the solid state.

It is generally recognised that for the market place to enjoy the benefits of cheap, flexible devices, still higher efficiencies will be required. To do this, it is probable that new classes of photo-active polymers that can take up morphologies appropriate to light collection and charge formation will have to be made. Copolymers incorporating fullerene that can take up well-ordered domains to help percolate charges out of the active layer to the electrodes provide one possible route. This talk will discuss the way in which the fullerene is incorporated into an organic solar cell can change considerably the morphology of the active layer and the device efficiency.




(a)



(b)

**Figure 1** a) A representative fullerene molecule used in organic solar cells, such as that shown in (b).

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