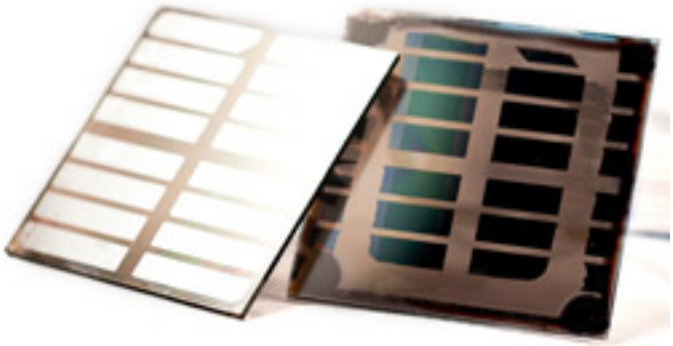
Imec, Polyera and Solvay set 8.3% efficiency record for organic solar cell with inverted device architecture



Leuven,Belgium -- December 15, 2011 – Imec, Polyera and international chemical group Solvay have achieved a new world-record efficiency of 8.3% for polymer-based single junction organic solar cells in an inverted device stack. These excellent performance results represent a crucial step towards successful commercialization of organic photovoltaic cells.

Solar power is gradually becoming cost-competitive with traditional mainstream energy sources such as coal, oil, and nuclear. Continued reduction of manufacturing and installation costs of solar panels will further drive this cost-competitiveness. Organic solar cells are holding the promise of addressing these issues, due to their potential to be manufactured on large-areas at high-throughput, and on lightweight, flexible substrates (like plastic or textiles), significantly reducing transportation and installation costs. This, along with optical translucency, gives organic solar cells the potential to be cheaply integrated into everything from clothing to building facades and windows.

Imec has developed a proprietary inverted bulk heterojunction architecture for polymer-based solar cells that simultaneously optimizes cell light management and increases device stability. With this architecture, and a proprietary Polyera semiconductor in the photoactive layer, a team of imec and Solvay researchers now announces a certified conversion efficiency of 8.3%. This is the highest certified efficiency reported to date in the world for inverted polymer cell architectures. This result follows previous reports on imec’s proprietary device architecture, proving that scalable inverted device architectures are applicable to a variety of polymer materials. Although further improvements of efficiency and lifetime are required to

bring this potentially-revolutionary technology to market, inverted device architectures offer a number of commercially-relevant benefits over standard architectures. As such, this milestone represents another advancement towards commercially-viable organic solar panels.

Tom Aernouts, R&D Team Leader Organic Photovoltaics at imec: “These excellent results are the fruit of an intense collaboration between Solvay, imec and Polyera. It is remarkable to see how the inverted architecture adds to the performance of these cells! This shows how crucial the combination of high-level device technology and next-generation materials will be to bring organic solar cells to the market.”

Patrick Francoisse, Sustainable Energy Platform Manager, Innovation Center, Solvay: ”Solvay is convinced organic photovoltaic devices will play an essential role in the future, as they will not only be easier and cheaper to produce, but will also enable new applications. These milestone results demonstrate how collaboration between a world-class chemical company, an innovative materials developer like Polyera, and a highly-regarded research and development center like imec can produce breakthrough results that bring the first day of mass production closer. Next to increasing efficiency, our efforts will now also turn to increasing size, and lifetime of the cells.”

Antonio Facchetti, CTO of Polyera: "This is great work done by the teams at imec, Solvay, and here at Polyera. We’ve now demonstrated that with a combination of accurate control over semiconductor polymer chemistry and innovative cell architectures, new efficiency milestones can be achieved". Martin Drees, OPV Device Team Manager at Polyera: "We’re excited by the great technical progress we’ve seen over the past few months, and expect to see the rate of achievement continue to accelerate during the coming year.”

Further information on imec can be found at www.imec.be [1].

Further information on Solliance can be found at www.solliance.eu [2]

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[1] http://www.imec.be
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