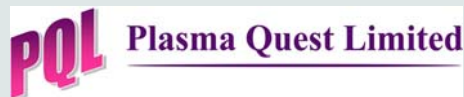


PARTNERS

RTD performers



Industrial and SMEs



“DEVELOPMENT OF RECOVERY PROCESSES FOR RECYCLING OF VALUABLE COMPONENTS FROM FPDs (In, Y, Nd) FOR THE PRODUCTION OF HIGH ADDED VALUE

FUNDED BY:



European Commission

7th Framework Programme

NMP2-SE-2012-310312





HIGH-ADDED VALUE NANOPARTICLES



SUMMARY

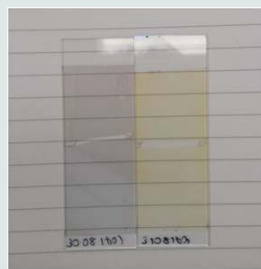
RECYVAL-NANO Project has been focused in the development of a Flat Panel Displays (FPDs) recycling process to obtain high added value components as Indium, Yttrium and Neodymium

In fact, one of the results of the project has been the production of high added value ITO, $Y_2O_3:Eu^{3+}$ and NdFeB mixed oxide nanoparticles which have been employed to promote high efficient applications in TCOs, phosphor materials and permanent magnets, respectively.

In the case of indium, ITO nanoparticles have been synthesized successfully by FSP starting from recycled surrogate precursors, showing similar properties than ITO nanoparticles obtained from commercial precursor. Economical assessments have showed that this situation involves a clear reduction of costs when starting from recycled raw material and could be extended to other materials.

ACHIEVED GOALS

- ◇ Use of nanoparticles in ITO target production could simplify sintering steps, therefore reducing costs and energy consumption.
- ◇ ITO coatings from nano-based targets have been obtained, with promising results of resistivity ($5 \times 10^{-4} \Omega \cdot \text{cm}$) and transparency (~95%).
- ◇ $Y_2O_3:Eu^{3+}$ nanophosphor revealed a higher efficiency in UV light conversion than $Y_2O_3:Eu^{3+}$ microphosphor even at lower concentrations.
- ◇ Modified LED systems have been developed employing $Y_2O_3:Eu^{3+}$ nanophosphor.

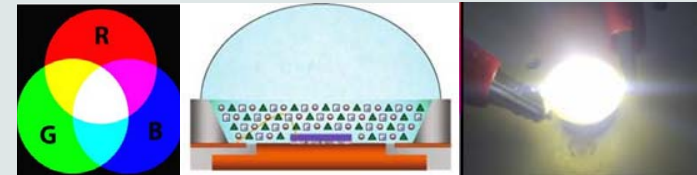


POTENTIAL APPLICATIONS

ITO coating are used in the development of new technologies such as smartphones, tablets, solar cells, OLEDs, etc.



High efficient nanophosphors have applications in lighting like LEDs, fluorescent lamps, phosphor thermometry, glow-in-the-dark toys or cathode ray tubes among others.



Neodymium based magnets are used in a multitude of applications such as hard disk drives, electric vehicles, wind turbine engines or automotive among many others.

