

## **Activation of photoluminescence glass in public squares**

**Prof. Rasha Mohammed Ali Hassan**

Faculty of applied arts- glass department- Helwan University.

[rashazenhom@gmail.com](mailto:rashazenhom@gmail.com)

**Prof. Mohamed Abdel-Fattah Mohamed Marzzouq**

Professor of Glass Chemistry and Technology - Glass Research Department - National  
Research Center

[marzouk\\_nrc@yahoo.com](mailto:marzouk_nrc@yahoo.com)

**Assist. Prof. Dr. Doaa Hamid Hussein**

Faculty of applied arts- glass department- Helwan University.

[doahamed2015@yahoo.com](mailto:doahamed2015@yahoo.com)

**Researcher. Hala Mohamed Ahmed Omar**

Designer

[hala.art.glass@gmail.com](mailto:hala.art.glass@gmail.com)

### **Abstract**

Excessive energy consumption is one of the most important global problems of our time. It has been found that the lighting process consumes a large part of the electric energy, so science in all its fields seeks to find alternative sources that help to provide this huge consumption of electrical energy. Especially with the growth of interest in environmental design, which depends on the use of alternative and renewable energies in architecture for which sustainability and its principles are among its priorities, Hence, the research undertakes a study on the concept of environmental design, its philosophy and requirements, in addition to a study on smart materials and their classification according to their characteristics. The research also went through the development of types of energy-converting smart glass materials represented by Photoluminescence glass as spectral emission materials, This is done by preparing it in the laboratory from a new chemical formula consisting of silicon phosphate glass containing heavy element oxides such as barium or bismuth as a host medium for rare earth For dyspressium oxide in order to reach a Photoluminescence glass that gives the phosphorescent green color for its inclusion in the design of buildings and various architectural formations and to take advantage of its functional and aesthetic properties. In developing public squares for lighting purposes, Where we find that most of the emissive or phosphorylated materials are safe and environmentally friendly and work to improve electric energy efficiency and rationalize its consumption in addition to being stronger in lighting and this is what distinguishes them from traditional means, The prepared glass was evaluated in terms of optical emissivity by making several measurements to reach how to benefit from it in the field of spectral emission, as it greatly contributes to reducing energy consumption through its ability to store absorbed energy and transmit it back in the dark. A design study of a monument was made of photovoltaic glass and drawn as three-dimensional to achieve the design idea required for its application in the public square.

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Environmental design, Energy-saving architectural glass, Photoluminescence glass, Smart glass materials, Phosphorescent materials