

ISSN 1047-9239

## **Improvement of the Thermal, Photo and Mechanical Properties of Poly (Vinyl Chloride) in Presence of Poly (Glycidyl Methacrylate)**

**Abir S. Abdel-Naby**

Department Chemistry, Faculty of Science, Fayium University, Egypt

American Journal of Applied Sciences

Volume 8 (7) (2011) 670-680

Impact factor: 1.4

### **Abstract:**

**Problem statement:** Poly (vinyl chloride) suffers from poor heat stability. The thermal degradation of the polymer leads to the evolution of hydrogen chloride gas, extensive discoloration of the polymer and lowering of physical and mechanical properties. **Approach:** Binary blends of Poly (Vinyl Chloride) (PVC) and Poly (Glycidyl Methacrylate) (PGMA) have been prepared by solution blending aimed at the improvement of thermal and mechanical properties.

### **Results and Conclusion:**

Thermal properties of the blends were studied using Scanning Calorimetry (DSC), Thermogravimetry (TGA) and potentiometric rate of dehydrochlorination. The increase of the PGMA content in the blend leads to thermal stability of the blend as shown from the thermogravimetry and the rate of dehydrochlorination results. All blends exhibited one major glass transition temperature (T<sub>g</sub>) whose position on the temperature scale was lowered with increased level of PGMA. The miscibility of blends was also confirmed by the use of Scanning Electron Microscope (SEM). The improvement of the mechanical properties of various blends of the two polymers was also obtained.

**Head of the Department**

**Dean of the Faculty**