



## ***Sesum indicum* Oil as a Potential Inhibitor for the Corrosion of Copper in Acidic Environment**

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### **ABSTRACT**

The inhibitory action of *sesum indicum* oil on the surface of copper metal in 0.5 N HCl using gravimetric and galvanostatic polarization methods has been investigated. The rates of corrosion of copper metal with hydrochloric acid containing *sesum indicum* oil were obtained as a function of the oil amount. The inhibitor efficiency was found to depend on the concentration of the *sesum indicum* oil. Adsorption of *sesum indicum* oil on copper metal was followed the Langmuir adsorption isotherm. The phenomenon of physical adsorption has been proposed on the basis of evaluated thermodynamic parameters.

**Keywords:** Corrosion, Gravimetric technique, *Sesum indicum* oil, Galvanostatic polarization.

### **INTRODUCTION**

Control of metal's corrosion is a sensitive part of scientific, commercially, and atmospherically point of view. The work on latest and eco friendly corrosion inhibitors has become a necessary to protect different important metals from corrosion. The appreciable works have been made to search suitable organic compounds which to be used as corrosion inhibitors in different acidic solutions, to retard the extreme attack on the metal. On account of the well known negative consequence of most artificial corrosion inhibitors and the need to work on economical, harmless and eco friendly benign processes, the efforts have been done

by many investigators to attention, on the work of eco friendly corrosion inhibitor<sup>1-8</sup>. Some of the natural oils are also found to be the good corrosion inhibitor like natural Artemisia oil<sup>9</sup> on steel and Jojoba oil<sup>10</sup> on aluminium. It has also been found that compounds which containing polar elements like nitrogen, sulphur and oxygen which have lone pairs of electrons exhibit good corrosion inhibiting property<sup>11</sup>. The oil of *Sesum indicum* is rich in manganese, copper and also contains vitamin B<sub>1</sub> (thiamine) and vitamin E (tocopherol). They contains lignans such as sesamol, sesamin and sesamin. The percentage composition of fatty acid is 44%, stearic acid 4.2%, palmitic acid 9% and arachidic acid 0.7%<sup>12</sup>. The presence of sesamol, sesamin



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Abstract



References



Citations



Supplementary Data



Suggestions

PMMA and PVC thermoplastic polymers were irradiated with 50 MeV Li<sup>+3</sup> ions to the fluences of 10<sup>10</sup> to 10<sup>12</sup> ions/cm<sup>2</sup>. XRD and DMA techniques were utilized to study the induced changes in structure and glass transition temperature of pristine polymer films. The XRD results show increase in the degree of crystallinity upon ion irradiation at low fluences ( $\leq 10^{11}$  ions/cm<sup>2</sup>) and decrease in crystallinity at high fluences ( $>10^{11}$  ions/cm<sup>2</sup>). Upon swift heavy ion radiation, the glass transition temperature of the polymers increases upto 10<sup>11</sup> ions/cm<sup>2</sup> fluence due to induced crosslinking and beyond this fluence, a decreasing behaviour is observed due to chain scissioning in polymeric structure.

**Keywords:** Glass Transition Temperature; Lithium Ion Beam Irradiation; PMMA; PVC Thermoplastic Polymers; Structural Characterization

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