

# 1 Phenothiazine-chitosan based materials for mercury 2 removal and fast naked eye detection

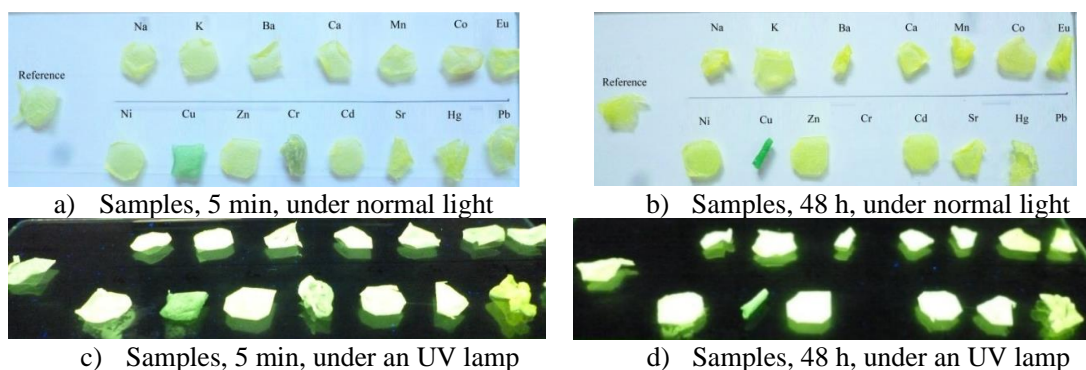
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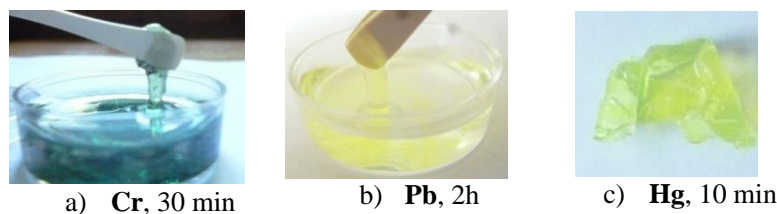
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9 This study reveals the ability of an eco-friendly luminescent xerogel prepared by chitosan  
10 crosslinking with a phenothiazine chromophore to detect and remove heavy metals. Its ability to  
11 give a different morphological and optical response towards fifteen environmental relevant metals  
12 was investigated by naked eye and UV lamp (**Figure 1**), fluorescence spectroscopy and scanning  
13 electron microscopy. A particular response was observed for mercury, consisting in the  
14 transformation of the xerogel into a rubber-like material accompanied by the red shifting of the color  
15 of emitted light from yellow-green to greenish-yellow domain. The peculiarities of the metals  
16 anchoring into the xerogel were analyzed by FTIR spectroscopy and X-ray diffraction. The  
17 morphological changes and the metal uptake were analyzed by SEM-EDAX, swelling and  
18 gravimetric methods. It was concluded that mercury has a bigger affinity towards this heteroatoms  
19 rich system, leading to a secondary crosslinking, generating a great absorption capacity of 1673 mg/g  
20 and a specific morphological response for mercury ion concentrations up to 0.001 ppm.



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24 **Keywords:** phenothiazine; chitosan; mercury sensing; eco-adsorbents; solid state materials

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