

## Hydrogen-Bonded Organic Frameworks in Polymer Matrices for Acids Sensing

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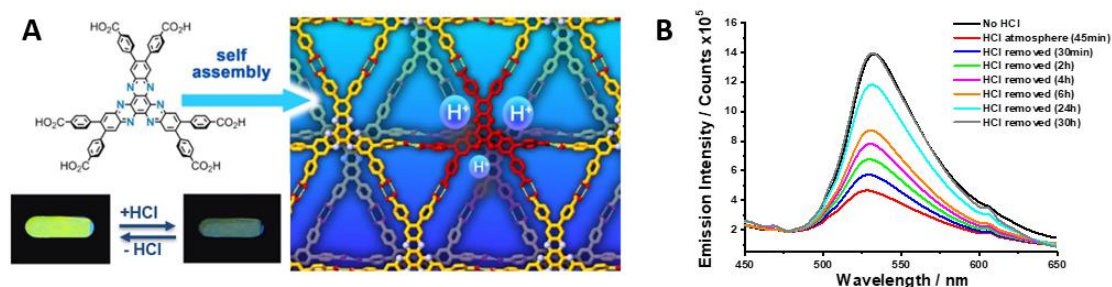
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Porous framework materials formed by organic molecules are currently at the forefront of materials chemistry and crystal engineering. Among these, hydrogen-bonded organic frameworks (HOFs) are an appealing, newly emerging class of porous materials thanks to their diverse applications such as gas storage, chemical sensing, catalysis and optoelectronic devices. HOFs are constructed entirely from organic molecules connected by non-covalent hydrogen-bonding interactions [1]. In this contribution, we present the sensitivity to HCl vapors of a HOF, based on a hexaazatrinaphthylene derivative with carboxyphenyl groups (CPHATN) (Figure 1A) that exhibits a rich photochemistry due to the interplay between intramolecular charge-transfer and inter-units proton-transfer reactions. The response can be easily followed by the quenching of CPGATN fluorescence [2]. For a practical use, the HOF was encapsulated in a polymer matrix, and it preserves its fluorescence properties. When the HOF/polymer film is exposed to HCl vapors, the HOF emission is strongly quenched ( $\sim 75\%$  for 45 min exposure). Interestingly, the initial emission spectrum is recovered to  $> 90\%$  by simply leaving the film at ambient conditions for 30 h (Figure 1B), clearly indicating potential of this composite as an active material in sensor devices for acid atmospheres for several cycles. Studies for the sensitivity of this material towards other organic and inorganic acids will also be presented.



**Figure 1.** A) Molecular and crystal structure of CPHATN. B) Emission spectra of CPHATN polymer film before and after exposing them to HCl atmosphere. The excitation wavelength was 370 nm.

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### References:

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