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Photochromic metal organic frameworks for inkless and erasable printing

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Of all the possible methods for developing inkless and erasable printing media, the best way is to use photochromic materials where new colour can be generated by simply application of suitable light. Typically, photochromic materials have the ability to change their own colour when subjected to a suitable light source and reverts back to its initial colour when the source of the excitation is removed. Thus, by controlling the incidence of the light on the printing media, precise impression of the desired content can be achieved on the media. Again, by the virtue of the reversible nature of the photochromic materials, they can easily return to their original colour, completing the erasing cycle. Thus, a successful media for inkless and erasable printing can be generated which can be used for printing some content on the same paper for multiple cycles, and more importantly without using any ink for printing and toxic chemicals for erasing. But, traditional photochromic materials, in general, bears short lifetime for their photogenerated colour and immediately reverts back to their initial colour when the source of the excitation is removed. Therefore, an attempt to use those materials as a media for inkless and erasable printing is not much promising as the printing will be immediately vanished into the background consisting of those short lived traditional photochromic materials. To overcome this problem, we must look for such a material which can retain their photogenerated colour for a prolonged period of time. In short, we need to modify the photochromic property of the material as per our requirement via chemical modification of the photochromic chromophore. And finally, we must develop a printer which can print the contents on the obtained media precisely for a bulk scale production and application in real life.

1. B. Garai, A. Mallick, R. Banerjee, Chem. Sci. 2016, 7, 2195-2200

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