



Sustainable catalysts to the rescue for chemical security: pesticide degradation and monitoring

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A main question to be solved is worldwide chemical security, specially involving imminent threats such as agrochemicals and chemical weapons. Their abusive and indiscriminate use and even of some banned substances requires effective methodologies for eliminating prohibited stockpiles and further monitor their presence with sensors. Besides their high toxicity, agrochemicals and chemical weapons are closely related due to their difficult degradation. In this way, herein some preliminary results as well as future perspectives will be presented, that are focused in developing novel catalysts that promote the degradation and monitoring of toxic agents such as organophosphates, through mechanistic study, rational material engineering using chemical modification, waste reuse and finally sensor development. On one hand, it is necessary to understand how the reaction occurs by elucidating its mechanism in order to ensure the effective degradation of organophosphates. Further, it is of interest to design "ideal" catalysts derived from complex matrices, such as sustainable materials (waste). These materials can be applied in the catalytic destruction of toxic agents due to their facile separation and also obtain simple and fast responsive detectors to monitor agrochemicals in food and in crops, that could also be applied to chemical attacks zones.

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