

## Photochemistry and spectroscopy of small, matrix-isolated organophosphorus molecules

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Based on our experience with spectroscopy and photochemistry of small nitriles, as well as nitrile-related isomers, ions, and radicals, we recently started to investigate their phosphorus-bearing analogues. The first results pertaining to the photochemistry of simple phosphalkynes (HCP, CH<sub>3</sub>CP) and phosphines (CH<sub>3</sub>PH<sub>2</sub>, HCCPH<sub>2</sub>) in rare gas solids will be presented. Dehydrogenation was the main process observed upon UV photolysis. It led to the spectroscopic characterisation of several previously unknown or poorly known species, namely H-CC-P<sup>1</sup> (triplet phosphinidene), CH<sub>2</sub>=PH (phosphaethene), and CH<sub>2</sub>=C=PH (phosphaallene). Matrix isolation of CP paved the way towards the hitherto uncharted quartet-doublet phosphorescence from that radical.

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<sup>1</sup> A. Lawzer, A., Custer, T., Guillemin, J.-C., Kołos, R. An Efficient Photochemical Route Towards Triplet Ethynylphosphinidene, HCCP. *Angew. Chem. Int. Ed.* **2021**, *60*, 6400.