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[235] Morphology drives the self-metalation of porphyrins on flat, thin MgO films.

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Self-metalation of 2H-tetraphenyl porphyrins (2H-TPP) on MgO thin films only occurs following charge transfer from the underlying surface. However, it is not clear whether the charging of the molecules is directly responsible for the metalation, or rather the charge-induced repositioning of the macrocycles.

Comparing the behavior of 2H-TPP with that of porphyrine (2H-P) by angular resolved photoemission spectroscopy and scanning tunneling microscopy, we have investigated the role of the macrocycles on the metalation.

We observed that 2H-P molecules self-metalated regardless of their charge state, demonstrating that the key factor in enabling the self-metalation of porphyrines on MgO is the proximity of the nitrogen atoms to the underlying surface.

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