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Nanostructured Metal (oxy)nitride Functional Materials

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Metal oxynitrides have shown prodigious potential in many fields including photocatalytic water splitting, optical detection and electrochemical applications. This is due to the physical and chemical properties of oxynitrides that can be easily tuned by varying their nitrogen and oxygen contents. Here we present series of our investigations on metal oxynitrides, from crystal structure studies to their applications. The works shown here include the crystal structure and anion ordering studies of metal oxynitrides as well as a simple process for preparing mesoporous transition metal nitrides without the use of nano-patterning or other template. Furthermore, these materials show remarkable properties for the fields of clean energy and sensing applications.