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**Iron geochemistry and organic carbon preservation by iron
(oxyhydr)oxides in surface sediments of the East China Sea and
the south Yellow Sea**

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Abstract: In marine sediments factors that influence iron (Fe) geochemistry and its interactions with other elements are diverse and remain poorly understood. Here we comparatively study Fe speciation and reactive Fe-bound organic carbon (Fe-OC) in surface sediments of the East China Sea (ECS) and the south Yellow Sea (SYS). The objectives are to better understand the potential impacts of geochemically distinct sediment sources and depositional/diagenetic settings on Fe geochemistry and OC preservation by Fe (hydr)oxides in sediments of the two extensive shelf seas around the world. Contents of carbonate- and acid-volatile-sulfide (AVS)-associated Fe(II) ($\text{Fe}_{\text{AVS} + \text{carb}}$) and magnetite (Fe_{mag}) in the ECS sediments are about 5 and 9 times higher, respectively, than in the SYS. This could be ascribed to the ferruginous conditions of the ECS sediments that favor the formation/accumulation of Fe_{carb} and Fe_{mag} , a unique feature of marine unsteady depositional regimes. Much lower total Fe(II) contents in the SYS than in the ECS suggest that lower availability of highly reactive Fe (Fe_{HR}) and/or weak Fe reduction is a factor limiting Fe(II) formation and

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