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Tracing the origin and geochemical processes of dissolved sulphate in a
karst-dominated wetland catchment using stable isotope indicators

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Abstract: Sulphur plays a critical role in the biogeochemistry of wetlands. SO_4^{2-} is the sulphur form that is most commonly assimilated by plants, and it is the medium of sulphur transformation in wetland ecosystems. The Caohai wetland is an important ecosystem on the Yunnan–Guizhou Plateau, SW China, and karst water is the most important water source in this wetland. In this study, the compositions of multiple isotopes ($\delta^{34}\text{SSO}_4$ and $\delta^{18}\text{OSO}_4$) were measured in groundwater, river water and wetland water in the Caohai catchment to elucidate the solute sources and behaviours of sulphate. The results suggest that SO_4^{2-} in groundwater is mainly derived from sulphide oxidation. Groundwater contributes a significant amount of sulphate to river water, and it is the main sulphate source of wetland water during the high-flow season. In contrast, rain water is the main sulphate source of wetland water during the low-flow season due to the reduction in groundwater recharge. These data indicate

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