



Physical and chemical evolution characteristics of Jurassic mudstone: an experimental study from landslide in Jurassic red-strata in the Three Gorges Reservoir area, China

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Since first impoundment of the Three Gorges Reservoir (TGR), landslides in Jurassic red-strata along the bank took place frequently. Most of them have similar geological conditions, whose lithology are mainly red mudstone and sandstone interbed. Long-term, periodic impoundment easily change properties of these mudstone and causes muddy interlayer. Based on the Jurassic Qianfoya (J2q) mudstone samples taken near typical landslide in the TGR area, related experiments under wet-dry cycles and different pH values were carried out to discuss the physical and chemical evolution properties of Jurassic mudstone. The experimental results show that: Under dry-wet cycle, large particles are mainly grained in the first three cycles, and small particles start to increase after that. After 15 cycles, composition of large particle was similar to the original mudstone, and clay minerals were concentrated in a portion smaller than 0.075 mm. When soaked for 45 days at different pH values, mudstone produced more small particles in acid and alkali solution, while more clay minerals were produced in neutral solution. These variation in properties of mudstone under different conditions indicate that, large particles in mudstone of landslides in Jurassic red-strata are easily converted into small particles under fluctuation of reservoir water level, which accelerates the argillation. Under influence of multiple effects in the later period, theses weak zone begin to shear, and finally turn to slip zone.