

CHARACTERISTIC EXPERIMENTS ON SEDIMENT IN THE YELLOW RIVER ESTUARY

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The Yellow River is famous for changeable river way, lacking of water and high sediment condensation. With large amount of sediment carried into the Bohai Sea by the River, the Yellow River Delta was maintained and developed. With the decrease of sediment source from up stream, the coastlines are fading and eroding. Because of complexity of sediment transport mechanism, especially the new change in recent years, the profoundly study on the rule of water and sediment movement of Yellow River Estuary is significant.

In this paper, a series of basic experiment were carried out. They are mineral components analysis, grain size analysis, flocculation settling experiment in still water and sedimentation experiment in current. The flocculation settling experiment was carried out in different artificial seawaters with variation of salinity from 2‰ to 29‰ according to Subow method. Sedimentation experiments was constructed to simulate the sediment-settling characteristic in current and to determine the starting and settling velocity. They have been carried out in a rotary ring flume.

The following results were attained:

Due to the high content of noncohesive mineral in the Yellow River Estuary sediment, flocculation settling was not the dominant contribution of deposition.

The optimal salinity for flocculation settling is 15‰~ 21‰(Fig.1),

The starting velocity of the sediment from the Yellow River Estuary is 50 ~ 60cm/s and the suspending velocity is 60cm/s(Fig.2).

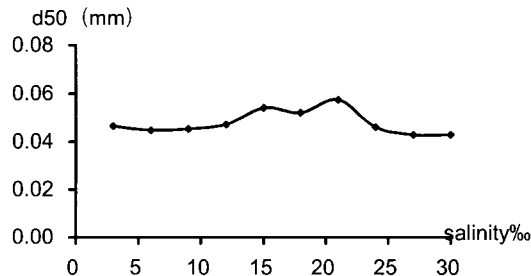


Fig. 1 Median diameter d_{50} of floc vs. salinity for Yellow River Estuary

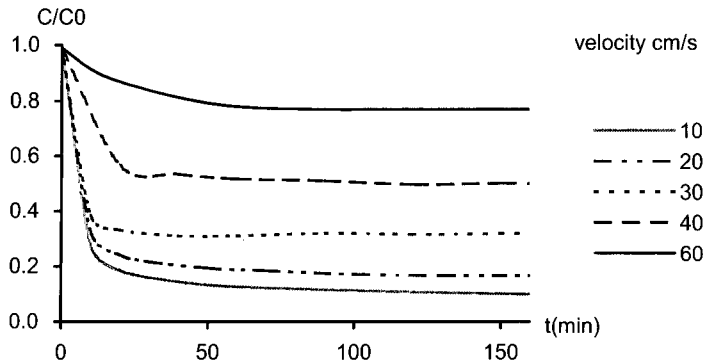


Fig.2.1 Current velocity vs. relative sediment concentration ($C_0 = 35\text{kg/m}^3$)
 C/C_0 : relative sediment concentration

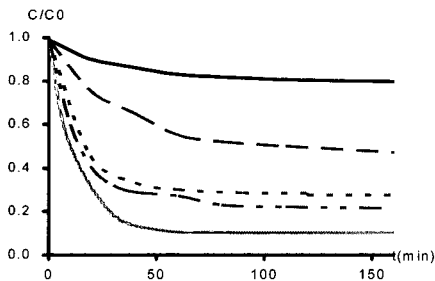


Fig. 2.2 Current velocity vs. relative sediment concentration ($C_0 = 25\text{kg/m}^3$)

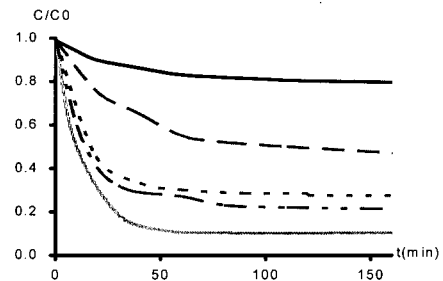


Fig. 2.3 Current velocity vs. relative sediment concentration ($C_0 = 15\text{kg/m}^3$)

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