



Effect of G-Intensity for Flocculation of Fine Sediment

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As the industry has developed over the past few decades, diverse structural and/or non-structural measures have been applied to untangle the water quality issues of the rivers which has been deteriorated. To achieve for these measures to be more effective, it is necessary to analyze the hydrodynamic and chemical behavior of river contaminants. Especially, heavy metals in river pollutants have positive electrical properties because they are ionized in water. On the other hand, fine cohesive sediments in river have a negative electrical property because they are colloidal in water. Therefore, heavy metals are easily adsorbed to fine cohesive sediments. Fine sediment offers large surface area relative to their volume, and an adsorption potential leading to agglomeration of contaminant at the particle surface. Because of these properties, fine sediments in river would be supposed to play a role as sinkage for contaminants such as heavy metals. This mechanism should be analyzed quantitatively. The floc and flow characteristics of the sediment should be preceded by a study to apply to the stream. In general, floc is a widely used concept in waterworks engineering and the mixing intensity, G , is used as a parameter to represent flow characteristics. Since G is a function of stirrer power and is generally applied to channels of constant width, the average velocity is used. However, since flocculation is a function of collision rate which is related to fluctuation of flow, applying G to stream flow is limited. In this study, turbulence intensity was selected as a parameter to analyse relationship between flow characteristics and flocculation of the stream. G -intensity with the fluctuation of the instantaneous velocity at the velocity term of G is newly proposed. To comprehend the effect of G -intensity on flocculation, the degree of flocculation on kaolin was measured by turbidity experiment. As a result, it was confirmed that there is a direct correlation between G -intensity and changes of turbidity. This study is a fundamental study to investigate the relationship between hydraulic characteristics and adsorption of the sediment with heavy metals in the river. In near future we will derive the optimal conditions of adsorption and the threshold of separation, if various experiment are performed on various heavy metals.