KSS Spring Conference 2004 / March 25~26, 2004 / Seoul / Korea

#### Erosion Characteristics of Kaolinite

 <sup>1)</sup>, Juhyung Lee, <sup>2)</sup>, Kiseok Kwak, <sup>3)</sup>, Jaehyeon Park, <sup>4)</sup>, Moonkyung Chung
<sup>1), 3)</sup>, Researcher, Geotechnical Engineering Research Dept., Korea Institute of Construction Technology <sup>2)</sup>, Senior Researcher, Geotechnical Engineering Research Dept., Korea Institute of Construction Technology <sup>4)</sup>, Research Fellow, Geotechnical Engineering Research Dept., Korea Institute of Construction Technology

**SYNOPSIS** : The erodibility of soil is an important factor to scour, especially in fine-grained soils. In this study, the erosion characteristics of kaolinite are quantified through the scour rate tests using the Erosion Function Apparatus called EFA. The basic soil property tests are also performed. The kaolinite samples are prepared by mixing with distilled water and formed to the designed maximum consolidation pressure of 60, 110, 160, 240, 360kPa, respectively. The results of the scour rate tests are presented in a format of a plot showing the relationship between erosion rates and shear stresses. Erosion properties of kaolinite showed a striking contrast according to the maximum consolidation pressure, and a correlation was established between the erosion properties of kaolinite and the soil properties; water content, undrained shear strength, dry density.

Key words : scour, kaolinite, Erosion Function Apparatus(EFA), critical shear stress

1. 서 론

)

(

가

가 가

| 1:1 | 60kPa ~ 360kPa |
|-----|----------------|
|     |                |

, , , , .

# 2. 세굴률 실험

## 2.1 실험재료

,

|     |   |      | ,    |   |
|-----|---|------|------|---|
| , · |   | #200 | 100% |   |
|     | , |      |      | 1 |
|     |   |      |      |   |

1.

|      |    |    |    |    | D₅₀<br>(mm) |  |
|------|----|----|----|----|-------------|--|
| 2.53 | 49 | 26 | 23 | CL | 0.0112      |  |

## 2.2 실험방법

|                  |   |   |      |   | 가        |
|------------------|---|---|------|---|----------|
|                  | • |   |      |   | 1:1      |
|                  |   | 1 | · ·  | 가 |          |
| 5 <sup>~</sup> 6 |   |   | 24   |   | 60, 110, |
| 160, 240, 360kPa | 5 |   |      |   |          |
|                  |   |   | ( 1) |   |          |

.



2001; Briaud et al., 1999; Kwak et al., 1999).

## 2.3 실험결과

|   | , | ,  |   |   |   | 2 |
|---|---|----|---|---|---|---|
|   |   | 가  | 가 |   |   |   |
|   | 5 | 7남 |   |   | 가 |   |
|   | , |    | 가 | , |   |   |
| 가 |   |    |   |   |   |   |

|               | (kPa) | (%)  | (t/m <sup>3</sup> ) | (kg/cm²) | (m/sec) | (N/m²) |
|---------------|-------|------|---------------------|----------|---------|--------|
| Kaolinite - 1 | 60    | 49.3 | 1.13                | 0.7      | 0.35    | 3.89   |
| Kaolinite -2  | 110   | 47.7 | 1.13                | 1.1      | 0.68    | 12.25  |
| Kaolinite - 3 | 160   | 46.4 | 1.16                | 1.2      | 1.07    | 27.11  |
| Kaolinite -4  | 240   | 46.2 | 1.17                | 1.4      | 1.20    | 33.36  |
| Kaolinite -5  | 360   | 44.4 | 1.19                | 3.0      | 1.52    | 50.75  |

| ი |   |
|---|---|
| 4 | • |

, 3 3~4m/s 가



## 3. 결 론

60kPa ~ 360kPa (1) 가 가 (2) 가 가 가 가 가 (3) 가 -가 가 가 가 , 가 가

(4) 7ł . . 7ł . . 7ł



#### 참고문헌

- 1. Briaud, J.L., Ting, F.C.K., Chen, H.C., Cao, Y., Han, S.W. and Kwak, K. (2001), 'Erosion function apparatus for scour rate predictions", *ASCE Journal of Geotechnical and Geoenvironmental Engineering*, Vol. 127, No. 2, pp. 105-113.
- Briaud, J.L., Ting, F.C.K., Chen, H.C., Gudavaiii, R., Perugu, S. and Wei, G. (1999), 'SRICOS: Prediction of scour rate in cohesive soils at bridge piers", ASCE Journal of Geotechnical and Geoenvironmental Engineering, Vol. 125, No. 4, pp. 237-246.
- Kwak, K., Briaud, J.L., Chen, H.C., Ting, F.C.K. and Han, S.W. (1999), 'Generalized sricos method and verification for prediction of scour depth versus time at bridge piers", *Res. Rep. Prepared for Texas Dept. of Transp.*, Dept. of Civ. Engrg., Texas A&M University, College Station, Tex.