24. GRAIN-SIZE ANALYSES, LEG 30

Gerald W. Bode, Scripps Institution of Oceanography, La Jolla, California

Sand-silt-clay distribution was determined on 10-cc sediment samples collected at the time the cores were split and described. The results are listed in Table 1.

The sediment classification used here is that of Shepard (1954) with the sand, silt, and clay boundaries based on the Wentworth (1922) scale (Figure 1). Thus the sand, silt, and clay fractions are composed of particles whose diameters range from 2000 to 62.5 μm, 62.5 to 3.91 μm, and less than 3.91 μm, respectively. This classification is applied regardless of sediment type and origin; therefore, the sediment names used in this table may differ from those used elsewhere in this volume, e.g., a silt composed of nannofossils in this table may be called a nanno ooze in a site chapter.

Standard sieve and pipette methods were used to determine the grain-size distribution. The sediment sample was dried and dispersed in a Calgon solution. If a sediment sample failed to disaggregate, it was treated with a sonic probe and, if necessary, hydrogen peroxide. Sediment samples which resisted the above treatment were not analyzed.

The sand fraction was removed by wet sieving using a 63 μm sieve, and the silt and clay fractions were analyzed by standard pipette analysis. Sampling depths and times were calculated using equations derived from Stokes settling velocity equation (Krumbein and Pettijohn, 1938, p. 95-96):

$$\frac{D}{t} = V = \frac{2(d_1-d_2)gr^2}{9\eta}$$

$$t = \frac{9D\eta}{2gr^2\,(d_1-d_2)}$$

where

V = velocity, in cm/sec
t = time, in sec*
D = depth pipette is inserted, in cm
g = gravity, in cm/sec²*
r = radius of individual particles, in cm*
d = density of solid particles arbitrarily set at 2.675 g/cc
d_2 = absolute density of distilled water at different temperatures (Hodgman et al., 1960, p. 2129)
η = viscosity of distilled water in poises at different temperatures (Hodgman et al., 1960, p. 2181)

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*Five figures were used in calculations to avoid rounding off variations.

TABLE 1
Grain-Size Determination, Leg 30

Sample (Interval in cm)	Subbottom Depth (m)	Sand (%)	Silt (%)	Clay (%)	Classification
Hole 285					
1-1, 126	1.26	3.1	41.5	55.4	Silty clay
1-3, 80	3.80	0.0	37.8	62.2	Silty clay
4-3, 110	59.10	0.0	50.6	49.4	Clayey silt
4-4, 61	60.11	0.0	52.0	48.0	Clayey silt
5-1, 81	75.31	0.0	55.2	44.8	Clayey silt
5-6, 96	82.96	2.2	54.4	43.4	Clayey silt
Hole 265A					
1-1, 67	131.67	0.1	44.3	55.7	Silty clay
1-2, 60	133.10	0.3	66.7	33.0	Clayey silt
6-3, 23	513.70	0.1	42.8	57.1	Silty clay
Site 286					
1-2, 12	1.62	4.9	62.0	33.1	Clayey silt
3-2, 79	37.79	0.3	42.0	57.7	Silty clay
4-1, 107	55.57	4.5	35.0	60.5	Silty clay
5-4, 20	78.20	0.0	11.5	88.5	Clay
6-5, 99	99.49	0.3	41.2	58.5	Silty clay
7-6, 76	120.23	1.5	50.4	48.1	Clayey silt
9-4, 66	154.66	2.9	61.3	35.8	Clayey silt
13-2, 11	227.11	5.6	66.7	27.6	Clayey silt
13-2, 98	227.98	64.0	31.3	4.7	Silty sand
15-1, 68	264.18	0.4	61.3	38.3	Clayey silt
17-5, 61	308.11	3.2	66.5	30.3	Clayey silt
23-2, 95	417.95	2.0	61.4	36.6	Clayey silt
25-3, 74	457.24	28.5	60.9	10.5	Sandy silt
28-2, 87	512.87	13.5	70.5	16.0	Clayey silt
28-2, 130	513.30	0.4	66.8	32.8	Clayey silt
Site 287					
1-3, 124	4.24	0.2	42.6	57.3	Silty clay
5-4, 57	79.87	0.1	28.8	71.1	Silty clay
5-4, 68	79.98	0.1	57.2	42.8	Clayey silt
6-3, 108	97.58	0.1	27.5	72.4	Silty clay
6-3, 119	97.69	0.3	12.3	87.4	Clay
6-3, 127	97.77	0.3	65.2	34.5	Clayey silt
8-1, 2	131.52	0.1	24.2	75.7	Clay
8-1, 42	131.92	1.5	25.7	72.8	Silty clay
8-3, 74	135.24	0.0	40.0	59.9	Silty clay
9-2, 74	152.74	0.0	43.7	56.3	Silty clay
10-1, 145	170.95	0.5	38.5	61.0	Silty clay
10-2, 25	171.25	0.1	15.9	84.0	Clay
Site 288					
1-2, 83	2.33	7.4	38.4	65.7	Silty clay
3-6, 22	37.02	4.8	29.5	65.7	Silty clay
3-6, 50	37.30	10.1	35.9	54.0	Silty clay
5-3, 87	71.37	9.9	31.8	58.4	Silty clay
6-2, 60	88.30	6.9	41.2	51.9	Silty clay
6-4, 44	91.14	6.8	41.2	52.0	Silty clay
6-4, 120	91.90	7.0	48.1	44.9	Clayey silt
9-1, 43	171.93	2.7	43.8	53.6	Silty clay

TABLE 1 — *Continued*

Sample (Interval in cm)	Subbottom Depth (m)	Sand (%)	Silt (%)	Clay (%)	Classification
Site 289					
1-1, 100	1.00	22.0	34.8	43.2	Sand-silt-clay
4-3, 125	32.75	9.4	30.9	59.7	Silty clay
6-1, 93	48.43	8.3	27.1	64.6	Silty clay
8-1, 50	67.50	7.8	33.0	59.2	Silty clay
10-3, 80	89.30	12.2	36.7	51.1	Silty clay
12-2, 89	106.89	12.1	34.5	53.4	Silty clay
14-2, 10	125.40	4.0	32.1	63.9	Silty clay
16-2, 30	144.40	8.3	36.6	55.1	Silty clay
18-2, 40	163.40	8.5	35.0	56.5	Silty clay
20-2, 56	182.66	7.8	24.1	68.1	Silty clay
22-2, 124	202.24	9.2	38.6	52.2	Silty clay
24-2, 26	220.26	5.5	24.6	69.9	Silty clay
26-3, 58	241.48	7.0	42.0	50.9	Silty clay
28-3, 66	260.56	11.7	29.8	58.5	Silty clay
30-3, 110	279.60	8.8	47.0	44.2	Clayey silt
32-3, 66	298.16	11.4	46.5	42.1	Clayey silt
34-3, 60	317.10	3.8	57.7	38.6	Clayey silt
36-3, 66	336.46	6.1	50.4	43.5	Clayey silt
38-3, 67	355.67	7.8	45.9	46.3	Silty clay
40-3, 56	374.46	8.3	52.5	39.1	Clayey silt
42-4, 90	395.40	15.3	44.3	40.5	Clayey silt
44-3, 20	412.00	22.0	43.6	34.4	Sand-silt-clay
47-3, 30	440.30	20.1	35.7	44.3	Sand-silt-clay
48-3, 46	450.46	17.7	31.3	50.9	Silty clay
50-3, 70	469.70	13.8	41.6	44.6	Silty clay
52-3, 131	489.31	18.9	46.4	34.7	Clayey silt
56-3, 66	526.16	5.7	64.7	29.6	Clayey silt
58-3, 90	545.90	7.3	57.0	35.7	Clayey silt
60-3, 76	564.26	11.1	51.5	37.4	Clayey silt
62-2, 55	581.55	9.9	41.2	49.0	Silty clay
66-3, 67	621.17	17.2	44.5	38.3	Clayey silt
68-3, 65	640.15	10.7	43.7	45.6	Silty clay
70-3, 60	659.60	11.9	45.3	42.8	Clayey silt
72-3, 75	678.25	7.9	48.5	43.6	Clayey silt
64-3, 41	697.41	17.1	46.9	36.1	Clayey silt
76-3, 82	716.32	5.2	44.3	50.5	Silty clay
78-3, 80	735.30	5.7	48.9	45.5	Clayey silt
80-3, 83	754.33	5.7	45.4	48.8	Silty clay
82-3, 50	773.00	6.7	43.7	49.7	Silty clay
86-3, 70	811.20	4.2	47.3	48.6	Silty clay
90-3, 64	849.14	4.8	44.7	50.6	Silty clay
98-3, 131	925.81	3.0	45.5	51.5	Silty clay
99-5, 90	937.90	1.3	43.4	55.3	Silty clay
106-3, 106	1001.56	0.9	41.9	57.2	Silty clay

The reproducibility of the grain size analysis has been previously tested (Boyce, 1972), and it was found that over a period of time with several operators the
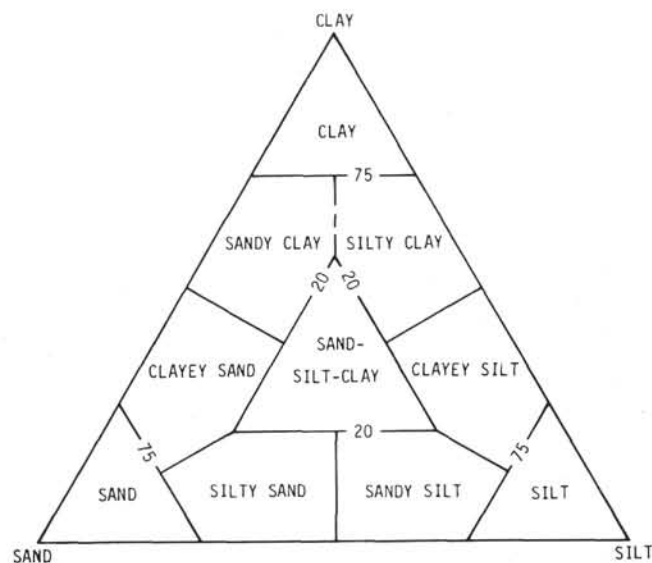

Figure 1. *Sediment classification after Shepard (1954) with the sand, silt, and clay size fractions based on the Wentworth (1932) Grade Scale: Sand, silt, and clay size particles having respective diameters of 2000 to 62.5μ, 62.5 to 3.91μ, and less than 3.91μ Shepard's (1954) sediment classification is a function of sand, silt, and clay size percentages and not composition.*

reproducibility for the sand-silt-clay fractions is ±2.5% (absolute). For detailed step-by-step procedures, see Volume 4 of the Initial Reports of the Deep Sea Drilling Project.

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