9: CARBON CARBONATE RESULTS

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Methods used in the determination of total carbon, organic carbon and calcium carbonate percentages were described in the Leg 1 cruise report. It has been assumed that all the carbonate occurs as calcium carbonate, though in a few places manganese carbonates are almost certainly present; however, the total carbonate content is not affected much by this assumption. The complete carbon carbonate results are given as Table 1.

RESULTS

Calcium Carbonate

Sediments sampled during Leg 2 are mainly of two main types: high carbonate marl or chalk oozes, and low to zero carbonate clays. Where intermediate carbonate values occur, this is due to mixing (whether by drilling or naturally is not known) of the two predominant sediment types.

Site 8

Sediments from Holes 8 and 8A are comprised of siliceous oozes and muds with a low carbonate content averaging 2.4 per cent.

Site 9

Most of the sediments in Hole 9 and all those from Hole 9A are clays with less than 10 per cent carbonate. However, in some cores from Hole 9 medium to high carbonate sediments occur interbedded with the brown clays. One possible explanation for these nannofossil marl or chalk oozes occurring in brown clays, deposited below the carbonate compensation depth (present water depth at this site is 4973 meters), is that they are turbidity current deposited; a careful examination of the cores will be necessary to substantiate this explanation.

Site 10

This site is presently below the carbonate compensation depth, but from Upper Cretaceous to Pliocene times the water depth must have been shallower than its present depth of 4712 meters because of the predominance of high carbonate sediments. With the exception of Core 2, all sediments from this hole have carbonate values ranging from 42 to 94 per cent, with an average carbonate content of 69 per cent. The sediments are either nannofossil marls or chalk oozes.

In Core 2, values of carbonate of 22 and 24 per cent were recorded from sediments which comprised a mixture of brown clays and nannofossil marl ooze.

Site 11

Sediments from the hole comprise nannofossil-foraminifera chalk oozes with an average carbonate content of 82 percent.

Site 12

Sediments from Hole 12B are clays which contain altered volcanic material and have an average carbonate content of 2.3 per cent. In Hole 12C from Core 5 through 11 the samples of clay averaged less than 1 per cent carbonate. However, nannofossil-foraminifera marl or chalk oozes of Pliocene to Quaternary age in Hole 12C (Cores 1, 2R, and 4) contain carbonate values ranging from 51 to 74 per cent. This would indicate that there has probably been a decrease in water depth at this site since the Pliocene.

Carbon

The total carbon content of sediments from Leg 2 varied from zero to 12 per cent, and the organic carbonnate (i.e., non-carbonate carbon) from zero to nearly 5 per cent. Nannofossil marl and chalk oozes have total carbon contents varying from 5 to 12 per cent. Clays have total carbon contents of less than 2 per cent. Comparatively high (greater than 1.0) organic carbon contents occur rarely in some of the nannofossil marls and chalk oozes. In most of the oozes and in all of the clays, the organic carbon content is less than 1 per cent.

The reason for a few high organic carbon values in some of the nannofossil marl and chalk oozes cannot be inferred from the core descriptions.

In addition to the total carbon results in Table 1, a summary of the results is also given as Table 2. Note that in Holes 9 and 12 where two very different lithologies are present, the results are separated into high and low carbon contents.

Hole	Core	Section	Sampled At (cm)	Total Carbon Per Cent	Organic Carbon Per Cent	Calcium Carbonate Per Cent
8	2	2	36-37	0.5	0.1	3.4
9	5	3	10-11	1.6	0.5	9.2
9	7	4	10-11	0.9	0.2	5.8
9	8	3	2-3	0.4	0.3	0.8
9	8	6	3.5-5.0	0.2	0.2	0.0
9	9	2	9.5-10.5	0.3	0.2	0.8
9	10	3	10-12	0.3	0.3	0.0
9	10	6	54-56	1.2	0.3	7.5
9A	1	6	9-11	0.4	0.0	3.0
9 A	3	4	95-96	0.0	0.0	0.0
9 A	5	1	70	0.2	0.2	0.0
10	1	1	75-76	8.1	0.0	67.5
10	3	1	75-76	8.0	0.6	61.6
10	5	3	79-80	10.6	0.0	88.3
10	7	3	10-11	6.4	0.0	53.3
10	9	1	63-65	7.7	0.0	64.1
10	10	1	106-108	11.1	0.0	92.5
10	10	3	15-17	11.6	0.3	94.1
10	12	2	10-12	10.0	0.2	81.6
10	13	1	100-101	10.5	4.0	54.1
10	13	3	100-102	10.7	0.1	89.1
10	14	3	119-120	10.4	0.0	86.6
10	15	2	119-122	10.6	0.2	86.6
10	16	2	96-98	9.9	0.1	82.5
10	17	1	143-144	10.9	0.1	90.0
10	18	2	99-100	10.4	0.0	86.6
11	1	1	11-13	10.0	0.0	83.3
11 A	4	2	0-10	10.9	4.7	51.6
12B	1	1	15-17	0.2	0.0	1.7
12B	2	2	13-15	0.2	0.1	0.8
12C	1	1	125-131	8.1	0.0	67.5
12C	1	4	145-150	6.4	0.2	51.6
12C	2R	3	145-150	7.1	0.1	58.3
12C	4	2	18-20	8.4	0.1	69.1
12C	5	2	78-80	0.2	0.0	1.7
12C	7	1	16-18	0.0	0.0	0.0
12C	9	1	124-126	0.0	0.0	0.0

 TABLE 1.

 Carbon-Carbonate Results for Leg 2 Samples

	Total Carbon %		Organic Carbon %		Ratio
Hole	Range	Average	Range	Average	Total Carbon/ Organic Carbon
8, 8A 9, 9A	0.2-0.6	0.4	0.1-0.4	0.1	4:1 3:1
-,	3.2–9.2	6.1	0.2-1.3	0.5	12:1
10 11, 11A	5.4-11.6	9.6 10.9	0.0-4.8	0.7 1.0	14:1
12 B , 12 C	6.3–8.9	7.7	0.0-0.2	0.1	not given (as meaningless)
	0.0-0.5	0.2	0.0-0.2	0.1	

TABLE 2.Average Carbon Contents of Sediments from Leg 2.