

17. K-AR DATES OF SITE 322 AND SITE 323 BASALTS

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SITE 322 RESULTS

Two basalt cobbles recovered from Site 322 were dated (see Table 1). The textures of the cobbles encountered in the hole suggest that the basalt is extrusive. Consequently, it is possible that the samples contain excess radiogenic Ar^{40} , leading to anomalously high dates (Dalrymple and Moore, 1968). The mineralogy of the cobbles suggests a tholeiitic composition; however, the K concentrations measured for the samples are higher than one would expect for fresh ocean floor tholeiites ($\sim 0.2\%$; Engel et al., 1965). It is therefore possible that K addition has occurred thereby lowering their dates (Seidemann, in press).

The dates obtained for the two cobbles are the same (~ 11 m.y.; see Table 1), and fall within the range suggested by the rather sparse fossil evidence for the sediment directly overlying the basalt (~ 10 -40 m.y.). The agreement between the K-Ar dates is surprising in light of the differences in both the K and Ar^{40} contents between the samples. One would not expect that samples containing different amounts of excess radiogenic Ar^{40} have each undergone just enough K addition to bring their dates into agreement.

The dates obtained may represent real emplacement ages, but the potential problems that exist in obtaining reliable dates for these samples make any interpretation of their meaning highly speculative.

SITE 323 RESULTS

A sample of holocrystalline basalt recovered from Site 323 was dated (see Table 1). Because the textural evidence suggests that the basalt is from the interior of a cooling unit, I believe that it contains no excess radiogenic Ar^{40} .

The mineralogy of the basalt suggests that it is tholeiitic; however, its K content is higher than one would expect for a typical ocean floor tholeiite ($\sim 0.2\%$; Engel et al., 1965), suggesting that age lowering by K addition may have occurred.

TABLE 1
Leg 35, Sites 322 and 323 K-Ar Results (2σ Errors Reported)

Core	Section	%K	Radiogenic Ar^{40} $\times 10^{-6}$ cc STP	Date
Site 322				
12	1 piece 8	0.86 ± 0.02	0.38 ± 0.03	11.1 ± 1.2
			0.52 ± 0.18	15.1 ± 3.8
			0.35 ± 0.12	10.2 ± 3.6
12	1 piece 9	0.67 ± 0.02	0.27 ± 0.09	10.2 ± 3.6
			0.27 ± 0.01	10.2 ± 0.8
Site 323				
21	CC	0.74 ± 0.02	1.38 ± 0.03	46.2 ± 2.4
			1.40 ± 0.03	47.0 ± 2.4

The K-Ar date (~ 47 m.y.) is lower than the dates suggested by both paleontologic evidence (~ 65 m.y.) and paleomagnetic evidence (~ 75 m.y.). The lower K-Ar date may indicate that either the sample is from a sill that intruded later than the formation of basement, or that it has undergone age lowering by K addition.

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