

29. K-AR AGES OF GLAUCONITE FROM SITES 280 AND 281, DSDP

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INTRODUCTION

Three K-Ar ages are presented for glauconites separated from Tertiary sediments at subantarctic Sites 280 and 281 of DSDP Leg 29. Glauconite concentrates were prepared at -36 +85 mesh size by magnetic methods. They were then analyzed by X-ray diffraction to check the purity and crystallographic state of the glauconites.

The K-Ar analyses were done by standard methods (Hulston and McCabe, 1972), potassium being analyzed by flame photometry and argon by extraction in vacuo and mass-spectrometric measurement. The results are listed in Table 1.

RESULTS

The first two glauconite samples (R3199 GI and R3200 GI) come from a single sediment block, and the discrepancy in the ages suggests that some argon loss has occurred from one or both the samples. The measured ages, early Miocene according to Berggren (1969), are certainly quite discordant with the stratigraphic evidence of a mid to late Eocene age. Both samples are derived from a detrital clay sandstone in a generally clay siltstone sequence. Both are a pale gray-green, low-iron, low-potassium glauconite type which is generally unreliable for K-Ar dating (Burst, 1958; Hower, 1961). In these circumstances, the ages are of limited usefulness and can only be treated as minimum estimates.

The third glauconite sample (R3201G1) is a dark greenish-black high-iron, high-potassium type from a glauconitic sand. These conditions are far more favorable for K-Ar dating purposes (Burst, 1958; Hower, 1961). The measured age (20.2 m.y.) is much closer to the latest Oligocene age (about 23 to 25 m.y. according to Berggren, 1969) estimated from stratigraphic evidence. Even in this case, however, the K-Ar age should be treated as a minimum age for this horizon.

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TABLE 1
Results of K-Ar Analyses on Samples from Sites 280 and 281, Leg 29

Sample (Interval in cm)	Ins. No.	K(%)	⁴⁰ Ar (Radiogenic) nl/g	Age (m.y.)
280A-12-1, 84-90 ^a	R3199G1	4.897	3.463	17.7 ±0.8
280A-12-1, 95-100 ^a	R3200G1	4.937	3.114	15.7 ±0.7
281-13, CC (top) ^b	R3201G1	6.886	5.579	20.2 ±1.0

Note: $\lambda_{\beta} = 4.72 \times 10^{-10} \text{yr}^{-1}$, $\lambda_{\epsilon} = 0.584 \times 10^{-10} \text{yr}^{-1}$, $^{40}\text{K}/\text{K} = 0.0118 \text{ at } \%$.

^aFrom 235 meters subbottom below 4186 meters of water at 48°57.44'S, 147°14.08'E (immediately south of the South Tasman Rise)

^bFrom 118 meters subbottom below 1595 meters of water at 47°59.84'S, 147°45.85'E (south slope of the South Tasman Rise)