Paleomagnetism of about 10 Ma age volcanic rocks distributed around Otsu province, Northwestern Yamaguchi

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Alkaline basalts showing the K-Ar ages of about 10 Ma are widely distributed over Otsu province of Northwestern Yamaguchi, West Japan. We collected paleomagnetic samples of alkaline basalts from fourteen sites (K01 to K14) from this province, in order to detect tectonic movements in West Japan. K-Ar ages of alkaline basalts around four sites have already determined by Uto (1995). Seven or eight specimens per each site were used for magnetic measurement. Progressive thermal demagnetization was adopted to eliminate viscous remanent magnetization and to isolate the characteristic remanent magnetization (ChRM). The specimens from nine sites were demagnetized at eleven steps: every 50 degree C from 150 to 500 degree C and every 30 degree C from 530 to 590 degree C. The specimens from the rest five sites (K06, K07, K12 to K14) were demagnetized at eleven steps: 100, 150 degree C and every 30 degree C from 180 to 390 degree C, because it has been already known from the pilot trial that the specimens have a stable component with lower unblocking temperature. The ChRM component was analyzed using principal component analysis (Kirschvink, 1980). For twelve sites, one reliable ChRM component were isolated and for the rest two sites (K06, K07), almost all specimens showed unstable behavior during the demagnetization treatment. Specimens from only one site (K14) had a reversed magnetization and sampled outcrop of the other one site (K01) was judged not to keep the original situation, from the ChRM direction (the lower inclination). Data sets from 11 sites except for three sites (K01, K06, K07) were used to calculate mean virtual geomagnetic pole (VGP). The mean VGP was calculated to be latitude = 84.5 degree N and longitude = 155.2 degree E (k = 34.5, A95 = 7.9 degree). The mean VGP position was concordant with the geographic pole and also the Brunhes-chron VGP from Abu province (latitude = 88.8 degree N and longitude = 98.8 degree E, k = 38.2, A95 = 7.5 degree) (Morinaga et al., 2002), taking account to the confidence limits (alpha-95) of both VGP positions. This means that no tectonic movement since 10 Ma was paleomagnetically detected in this region. Although it is well known that Southwest Japan was rotated clockwise around 15 Ma as the result of the opening of Japan Sea, the effect of the opening was not recognized paleomagnetically since 10 Ma.