Mantle diapir or mantle wedge plume of NW Rota-1 volcano, Mariana arc

Y. TAMURA[1]*, O. ISHIZUKA[2], R.J. STERN[3], H. SHUKUNO[1], H. KAWABATA[1], R.W. EMBLEY[4], Y. HIRAHARA[1], Q. CHANG[1], J. –I. KIMURA[1], Y. TATSUMI[1], A. NUNOKAWA[1] AND S.H. BLOOMER[5]

[1]IFREE, JAMSTEC, Yokosuka 237-0061, Japan (*correspondence: tamuray@jamstec.go.jp)
[2]Geological Survey of Japan, AIST, Tsukuba 305-8567, Japan (o-ishizuka@aist.go.jp)
[3]University of Texas at Dallas, TX 75080-3021, USA
[4]PMEL, NOAA, Newport, OR 97365-5238
[5]Oregon State University, Corvallis, OR 97331

COB and POB

We found near-primitive and phenocryst-poor lavas from NW Rota-1 volcano in the Mariana arc. These magnesian basalts are petrographically distinct cpx-olivine basalt (COB) and plagioclase-olivine basalt (POB). Fo content of olivines and Cr# of spinels are higher in COB than in POB. Moreover, COB is lower in Zr/Y and Nb/Yb and TiO_2, Al_2O_3, Na_2O, P_2O_5, Nb, Ta, Zr, Hf, HREE and Y than POB both at MgO = 8 wt. % and at estimated primary magmas, suggesting that COBs formed from higher degrees of mantle melting. COB has Ba/Nb, Th/Nb, $^{87}Sr/^{86}Sr$, $^{208}Pb/^{206}Pb$ and $^{207}Pb/^{206}Pb$ that are higher than for POB, and also have steeper light REE-enriched patterns and lower $^{143}Nd/^{144}Nd$, indicating that COB has a greater subduction component than POB. $^{176}Hf/^{177}Hf$ values between COB and POB are the same and Hf behavior in COB and POB is similar to those of Zr, Y and HREE, suggesting that Hf is not included in the subduction component, which produced the differences between COB and POB.

Mantle Diapir or mantle wedge plume

These estimated subduction components suggest flush melting of subducting sediment of the uppermost part of the slab at the temperature between phengite-out and monazite-out temperature (~900 °C) and rutile-out and garnet-out (~1000 °C) [1]. We suggest that high temperature at the base of mantle wedge (>1000 °C) combined with slab-derived metasomatic agents (hydrous sediment addition) ultimately lead to enough partial melting and buoyancy to initiate diapiric ascent. Degrees of mantle melting of primitive COB and POB are ~24 % and 18 %, respectively. Diapiric ascent of hydrous peridotite mixed heterogeneously with sediment melts may be responsible for the NW Rota-1 basalts.

[1] Skora & Blundy (2010) *Journal of Petrology* **51**, 2211–2243.

General depositional features of the carbonate platform gas reservoir of the Lower Triassic Jialingjiang Formation in the Sichuan Basin of Southwest China: Moxi gas field of the central basin

XIUCHENG TAN[1,2]*, LING LI[2], HONG LIU[2], BING LUO[2], YAN ZHOU[2], JIAJIE WU[2] AND XIONG DING[1,2]

[1]State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation. Southwest Petroleum University, Chengdu, Sichuan 610500, China (*correspondence: tanxiucheng70@163.com)
[2]School of Resource and Environment, Southwest Petroleum University, Chengdu, Sichuan 610500, China

The general depositional features of the carbonate platform gas reservoir of the Lower Triassic Jialingjiang Formation in the Sichuan Basin of southwestern China were addressed based on a case study of the representative second member of the Formation (termed as Jia 2) in the Moxi gas field of the central basin. The features mainly include depositional setting, lithology, depositional structure, depositional sequence and reservoir space. These results lead to a conclusion that the Jialingjiang reservoir (the second member in particular) is not of a tidal flat deposition in an intertidal (to supratidal) environment as previously suggested but of restricted and evaporative carbonate platform deposition in a subtidal environment. The tidal-flat like (i.e. platform flat) facies occur only in the Jia 2^2-B layer. Moreover, the restricted-evaporative carbonate platform facies can be divided into 5 sub-facies and 23 micro-facies, of which the facies of grain shoal and dolomitic flat are relatively favorable for reservoir development. Their depositional model, distribution and evolution were further tentatively suggested, as the facies are subject to paleo-tomography and sea level variations. These results provide supplement to the present hot studies of the Permian-Triassic gas reservoir geology in China, as the Jialingjiang Formation has been investigated much less in comparison with the underlying Lower Triassic Feixianguan and Upper Permian Changxing formations.