NEW TYPE LAMPROITE OF THE DAHONGSHAN AREA, HUBEI PROVINCE, CHINA.

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The lamproite of Dahongshan area $(31^{\circ} - 31^{\circ} 44' \text{ N}, 112^{\circ} 32' - 113^{\circ} 20' \text{ E})$ lie immediately by the margin of the north part of Yantze craton. About 10 volcanic groups by sea bottom volcanic eruption and 40 hypabyssal intrusives constitute a lamproite belt with 70 km long and 1--6km wide. Their isotope ages range from 490Ma to 352Ma (i.e. from Cambrian to Devonian period).

In previous studies these rocks in this area had been called kimberlite-like, kimberlite, melitite besalts, glass dunite and Ol-Di lamprophyres. Among them four hypabyssal intrusives were identified as lamproite in early eighties. It was found in this work through petrography, geochemistry, mineralogy studies that the rocks mentioned above all belong to lamproites. But some rock bodies of them appear to be transitional between lamproite and kimberlite while other bodies between lamproite and minette.

Our investigation confirms the presence of four distinct rock face assemblages including three volcaniclastic facies and one hypabyssal face. The volcaniclastic facies show variation in occurrence, texture and structure and can be divided into volcanic diatreme; crater breccia.near volcanic crater lappili, far volcanic sed pyroclastic rocks and tuffite. The hypabyssal intrusive facies occur either separately intrusive body or associated with volcanic eruption rocks and formed lamproite volcanic suite from volcaniclastic rocks (agglomerate, breccia, lappiti and tuff including air-fall) to magma intrusive facies (including lava flow).

According to the suggestions by IUGS (1989) and Scott-Smith, Skinner (1985), Mitchell (1985), the textural and mineral assemblege classification can be recognized as follows, (see table)

The volcaniclastic rocks are mainly composed of olivine-lamproite and magma hypabyssal intrusives are composted of diopside lamproite.

The volcanic diatreme and crater facies consist of breccia (rare agglomerate). lappili and tuff. The compsitions of breccia are mainly autothic breccia of phlogopite-olivine lamproite. The first olivine generation corresponds to the macrocrysts found in kimberlites, but many of olivines are auhedral and show subhedral often with parts of the crystal margin having a complex but euhedral shape. This facics also contain many xenolith of country rocks, rare dunite xenolith ,upper mantle xenoliths forming symplectic intergrowths of spinel and crystal fragments. The cement is composed of carbonate, serpenite. etc.

teatural	mineral
1. Volcaniclastic rock	1.011vine lamproite
① agglomerate >64mm	① olivine lamproite
② breccia >2nm	② phlogopite-olivine lamproite
③ lappili ><2mm	(including ol-madupitic lamproite)
(4) tuff <2mm	(3) glass-olivine lamproite
2.Magma hypabyssal intrusive	2.Diopside lamproite
(5) lava flow	④ olivine-diopside lamproite
6 dikes, sills	(including ol-Di madupitic lamproite)
	⑤ leucite-olivine-diopside lamproite
	(6) sanidine-diopside-madupitic lamproite

The classification table of Dahongshan lanproite

Near volcanic crater facies lappili : this facies are of well-bedding structure which was formed by accumulation of various size lappili having well-sphericity. roundness and well-smoth. The lappili materials consist mostly of olivine lamproite or glass olivine lamproite. The crystal fragments are serpentization olivine, vermiculinization phlogopite and ilmenite. The cement is of carbonate, serpenite and clay mineral.

Sed pyroclastic rock and tuffite of far volcanic crater facies: The facies were formed by the alternation of pyroclastic sedimentary rock (including air-fall tuff) and dolomitic corbonate of middle Cambrian or early Ordovician system(two period) with well graded beddings. The fragment materials are mainly olivine lamproite but usually been resolued into monimorillonite and ferric material.

Magma hypabyssal intrusive facies: The rocks are with distinct porphyritic texture and are characterised by two generations of olivine(usually serpenization) having euhedral-subhedral and sometimes a complex but euhedral shape. The porphyritic minerals include diopside, leucite. The matrix is composed of phlogopite, sanidine. potassic richterite. apatite. rutile. ilmenite and glassy. Rare peridotite. dunite xenolith are found in some rock bodies.

The whole rock geochemistry about 150 samples from various facies show Sio_2 35-50%. Mgo 4-26% from balse to ultrabasic. The K₂o contents ar commonly less than that of the West kimberley larmpriote. The reason leading to low K₂o may be with relative to particular geological setting of sea-bottom volcanic eruption. As a result, it is not approriate to judge of ultrapotassic rocks from the K₂O content for the Dahongshan lamproite. However, the K₂O contenes of most samples range from 0.5% to 2%, some to 3-5%. The K₂O/Na₂O ratios are generally>2, average 6.55. The fresh volcanic glass are also high in K_2^0 ranging from 5.82% to 6.55%. These data show that the lamproites in Dahongshan area belong to ultrapotassic rock suite.

This suite is characteried by higher contents of Ba, Rb, Sr, Pb, Th, U, Ti, Zr, Nb, REE pattens are highly fractioned and enriched in LREE.

The isotopic compositions of the lamproites in Dahongshan area are $\mathrm{Sr}^{87}/\mathrm{Sr}^{86}$ =0.70380--0.70688, Nd¹⁴³/Nd¹⁴⁴=0.51165--0.51230, Pb²⁰⁶/Pb²⁰⁴=17.737--20.870, Pb²⁰⁷/Pb²⁰⁴=15.330--15.675, Pb²⁰⁸/Pb²⁰⁴=38.656--42.856, being in between type II kimberlites and lamproites, and appear a tendency for two driction evolution towards EMI and EMII form PREMA. The isotopic compositions show that the lmaproites of Dahongshan area may be relative to old subduction of proterozoic Era.

The minerals commonly present in the lamproites of Dahongshan area as major primary constitunt are olivine, diopside, phlogopite, leucite, sanidime, richterite, Accessoryphases include apatite, provskite, rutile, ilmenite. The xenocrysts include olivine, spinel, garnet, cr-diopside and ilmenite. For olivine, the compositions of phenocryst of two generations are Fo77-88, of xenocrysts and in mantle xenoliths (dunite. peridotite) are Fo 90-93. Diopside occurs as a phenocryst or groundmass. The compositions of diopside in many of hypabyssal intrusives are variation with two trends: A dominant trend is Ti increasing with Al increasing. Another is of preserving low Ti with Al increasing. The Cr-diopside are high in Cr_2O_3 ranging from 1.72% to 3.08%. The compositions of phlogopite also have two distinct trends of which one is the transitional type (high Al high Ti) towards minette, the other is the characteristics of lamproite. K-richterite of the West Australia lamproites.

The macrocryst compositions of spinel and garnet mostly belong to lberzolite suite and a few parts of them like harzburgite/dunite suite.

The lamproites in Dahongshan area are considered to be derived by partial melting of garnet lherzolite from lithosphere, where the depletion of perdotite soure appears to be less strong. The primary magma in metasomation zone of upper mantle had been replaced and enriched in LILE, then uprisen by diapirism and cut through the overlying crust along with sea-bottom volcanic eruption.