Three unusual clasts within Dong Ujimqin Qi mesosiderite. L. Y. Wang[1], W. B. Hsu[2], 1 Faculty of Earth Resources, China University of Geosciences, Wuhan, 430074, China (linyanwang@cug.edu.cn); 2 Key Laboratory of Planetary Sciences, Purple Mountain Observatory, Chinese Academy of Sciences, Nanjing, 210008, China.

Introduction: Dong Ujimqin Qi meteorite is only one fall mesosiderites recovered in China. It fell at 13：45 hr on September 7, 1995, in the area of the town of Dongwumuqin Banner, Inner Mongolia, China (45°30′N, 119°2′E)[1]. The total fragments of 128.8 kg were recovered [1]. Both silicate textures and metal compositions suggest that the Dong Ujimqin Qi mesosiderite was classified as type 1B [2].

Olivine is contained in silicate phase of Dong Ujimqin Qi in an amount of close to 5 vol %. Two types of olivine were identified: low-Mg ($\approx Fo_{62}$) and high-Mg ($\approx Fo_{83}$) [2,3], and low-Mg olivine(10-200μm) is smaller than high-Mg one(1mm-5mm).There are distinct differences between two types of olivine in the aspects of composition and texture. Here we present SEM and EMP analyses in three unusual clasts.

Analytical methods: SEM work was performed at using a Hitachi S-3400 N Ⅱ with a Oxford energy dispersive detector at laboratory for Astrochemistry and Planetary Sciences of Purple Mountain Observatory Chinese Academy of Sciences. Mineral chemistry was determined with an electron microprobe (JEOL JXA-8100) at State Key Laboratory of Geological Process and Mineral Resources of China University of Geosciences. An accelerating voltage of 15 KV, a 10 nA sample current, and a focused beam of ~1μm diameter were used for all analyses. The synthetic (NBS) and natural mineral standards were monitored during every run to check for bias.

Results: Three unusual clasts all contain fine-grained aggregate. The EMPA Data for each mineral are given in Table 1.

Symplectitic aggregate in low-Mg olivine clast A **($Fo_{61.4}$):** this clast contains intricate symplectitic intergrowths of chromite and orthopyroxene (Fig.1a). The symplectites occur at the boundary of a low-Mg olivine and the matrix of the mesosiderite. Orthopyroxene composition ($En_{67.0-69.1}$) is similar to that of matrix orthopyroxene ($En_{64.6.0-74.9}$) (Table 1).

Symplectitic intergrowth in high-Mg olivine clast B ($Fo_{83.2}$): this clast bears fine-grained intergrowths (symplectites) of chromite and orthopyroxene (Fig.1b). Orthopyroxene varies from $En_{78.4}$ to $En_{81.2}$ (Table 1). Chromite in this clast has poorer Cr_2O_3 than the chromite in symplectite of clast A (Table 1). Similar composition and texture have been observed in Budulan mesosiderite [4], NWA 1459 diogenites [5] and lunar rocks [6].

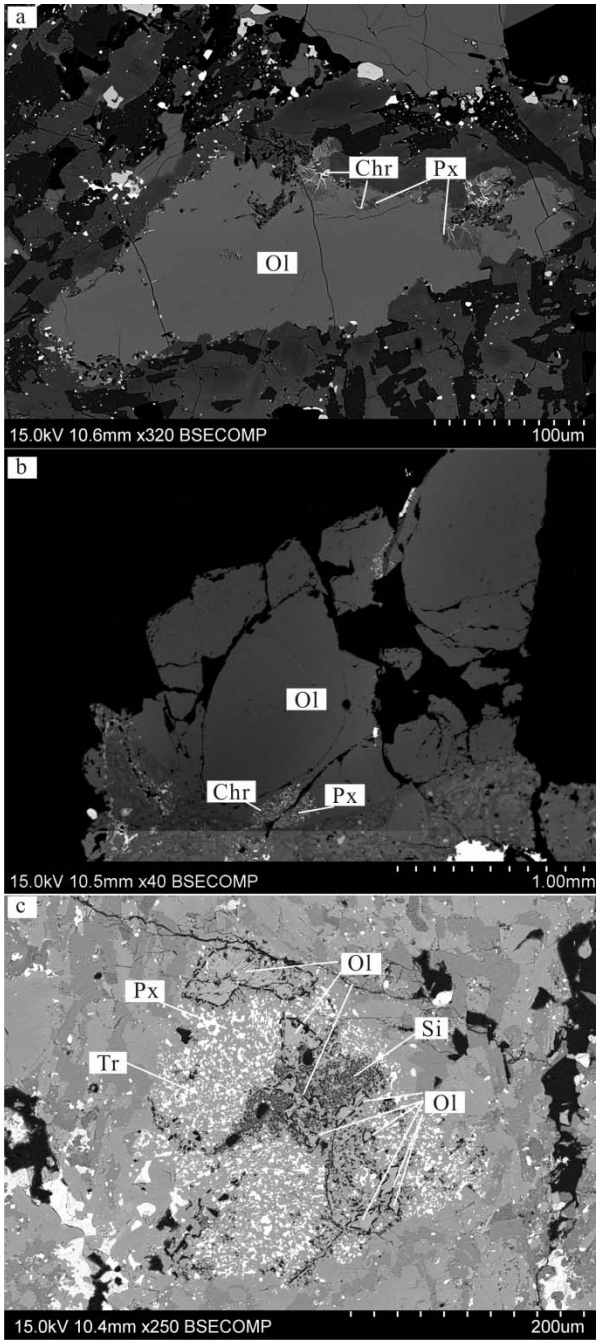

Fig. 1. Textures and secondary mineral aggregates in Dong Ujimqin Qi mesosiderite.
(a) Symplectitic intergrowths of chromite and orthopyroxene occur at a boundary of a low-Mg olivine and the groundmass of the mesosiderite; (b) Fine-grained symplectitic aggregate of chromite and

orthopyroxene in high-Mg olivine; (c) Aggregates of olivine, troilite, silica and orthopyroxene.

Olivine-orthopyroxene-troilite-silica aggregate clast C: this clast consists of t olivine, troilite, silica and pyroxene aggregates (Fig.1c). Orthopyroxene composition (En_{70}) is similar to that of matrix orthopyroxene ($En_{64.6.0-74.9}$) (Table 1). Olivine is low-Mg group ($Fo_{64.7}$) (Table 1).

References: [1] Tao K J. et al. (1997) *Acta Petrol. Sin., 13*, 254–259. [2] Kong P. et al. (2008) *Meteoritics & Planet. Sci.,* 43, 451–460. [3] Tao K J, et al. (2001) *Acta Petrol. Sin., 17*, 321-324. [4] Lorenz et al. (2010) *Petrology, 18*, 461 – 470. [5] Irving et al. (2003) *LPS XXXIV*, 1502-1503. [6] Bell P.M. et al (1975) *Proc. LSC 6th*, 231-248.

Table 1. Olivine, orthopyroxene and chromite compositions (wt %) in three unusual clasts of the Dong Ujimqin Qi mesosiderite.

	Mineral	SiO_2	MgO	FeO	CaO	MnO	Al_2O_3	Cr_2O_3	TiO_2	Total	Fo	En
Clast A	Unaltered Ol	36.4	29.4	33.3	-	0.68	-	-	-	99.7	61.4	
	Opx in symplectite	52.1	24.1	20.3	0.13	0.75	0.88	0.93	0.14	99.4		67.9
	Opx in symplectite	51.9	24.4	19.5	0.11	0.62	1.21	0.86	0.09	98.7		69.1
	Chr in symplectite	0.43	0.98	32.2	0.38	0.78	11.6	53.3	0.52	100.1		
	Chr in symplectite	1.95	1.32	32.2	0.05	0.77	10.8	51.7	0.39	99.2		
Clast B	Unaltered Ol	39.0	43.9	15.9	-	0.34	0.01	0.03	0.02	99.2	83.2	
	Opx in symplectite	55.1	29.9	12.4	0.08	0.47	0.19	0.12	0.08	98.3		81.2
	Chr in symplectite	0.19	2.87	29.9	0.66	0.65	15.7	48.1	0.77	98.9		
Clast C	Ol in aggregate	35.8	34.3	29.2	0.01	0.64	0.01	0.03	0.02	100.0	67.9	
	Opx in aggregate	53.31	25.40	18.80	0.13	0.56	0.88	0.53	0.09	99.7		70.7
Matrix	Average Ol	36.8	31.8	30.4	0.01	0.69	0.01	0.03	0.02	99.7	65.3	
	Average Opx	53.2	24.8	17.3	1.24	0.64	1.44	0.65	0.11	99.4		70.3