MINERALOGICAL STUDY OF THE YAMATO 983885 LUNAR METEORITE. H. Kaiden[1,2] and H. Kojima[1], [1]Antarctic Meteorite Research Center, National Institute of Polar Research, Tokyo 173-8515, Japan (kaiden@nipr.ac.jp). [2]Department of Polar Science, School of Mathematics and Physics, The Graduate University for Advanced Studies, Tokyo 173-8515, Japan.

Introduction: Lunar meteorites are of great scientific importance because, in some cases, they are derived from areas of the moon that were not sampled by the Apollo and Luna missions. Yamato (Y) 983885 was recovered by the Japanese Antarctic Research Expedition in 1999 and classified as lunar [1, 2]. Here we report mineralogical study of the Y983885 lunar meteorite.

Sample and Methods: A polished thin section Y983885, 71-1 was studied with an optical microscope using transmitted and reflected light. Mineral compositions were determined by quantitative wavelength dispersive X-ray analyses with JEOL JCXA-733 and JXA-8800M electron microprobes at the National Institute of Polar Research, Japan.

Results and Discussion: Y983885 is a polymict breccia containing abundant lithic, mineral and melt clasts (up to 1.2 mm in size) with fragments of minor opaque mineral set in a dark brown glassy matrix. Most large clasts are polymineralic and are composed of Ca-rich plagioclase, pyroxene and olivine. A few large clasts are composed of plagioclase and pyroxene, or only plagioclase. Smaller clasts are commonly mineral fragments of predominant plagioclase, with subordinate proportions of pyroxenes and olivines. Glass spherules, up to 0.3 mm in diameter, are also observed. Electron probe microanalyses indicate a range of pyroxene composition for the whole meteorite of $Wo_{2–40}$, $Fs_{12–55}$, $En_{14–85}$; a plagioclase range of $An_{89–98}$; and an olivine range of $Fa_{32–36}$, except one grain of Fa_{55} [2]. One of the lithic clasts with a subophitic texture (~ 0.4 mm) is a ferroan mafic lithology that may be a mare basalt or has mare basalt components. The select major element compositions of Y983885 determined by standard wet chemical analysis [3] and lunar highland crust [4] are shown in TABLE 1. Although Y983885 is generally a feldspathic regolith breccia, its relatively lower Al_2O_3 concentration than that of any other feldspathic lunar meteorites and highland crust (> 25 %) suggests that the meteorite is a mixture of mare and highland materials. Such "mixed" lunar meteorites include Calcalong Creek [5] of which the bulk Al_2O_3 concentration (~ 21 %) is similar to that of Y983885. Higher FeO and MgO concentrations than those of lunar highland crust (TABLE 1) also suggest that Y983885 is basalt-bearing.

TABLE 1. Bulk chemical composition (select elements) of Y983885 and lunar highland crust (wt%).

	SiO_2	TiO_2	Al_2O_3	FeO	MgO	CaO
Y983885 [3]	45.59	0.53	21.81	9.41	7.98	14.02
Highland [4]	45	0.56	24.6	6.6	6.8	15.8

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