The Comparison between Moon and Mars Spectrum

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INTRODUCTION

The moon and mars can not produce their own light. They are receive from sunlight. The spectroscopy method can detect a chemical element and compound. Both spectrum show absorption lines. This work show that the spectrum observed the reflected planet spectrum.

METHODS

1 Using Spectrometer + Telescope from Nakhon Ratchasima Regional Observatory – NARIT to took the moon's photos and mars's photos at bright and dark area.

Planewave CDK700

CCD model QSI632

Spectrum

2 Process spectra and eliminate noise In the spectrum graph → Aldela Program

3 Reduce noise, analyze absorption lines and compare spectrum graph. → Visual Spec Program

4 Normalize spectrum graphs and analysis ratio area of elements → ISIS Program

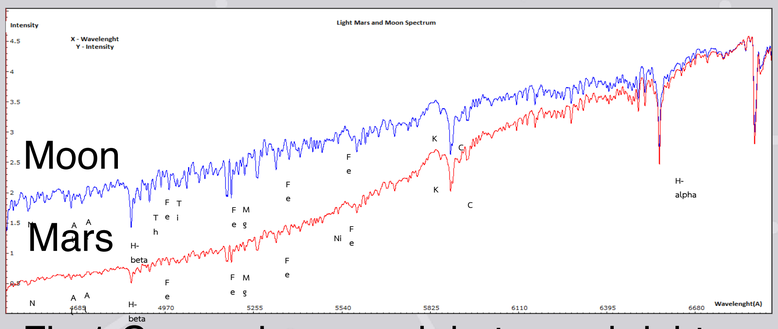
$$\text{Spectrum ratio of mars and moon} = \frac{\text{Sun spectrum, Earth'atmosphere, Mars'atmosphere}}{\text{Sun spectrum, Earth'atmosphere, Moon'surface}}$$

$$\text{Spectrum ratio of bright and dark area of mars} = \frac{\text{Sun spectrum, Earth'atmosphere , Mars'surface , Mars'atmosphere}}{\text{Sun spectrum, Earth'atmosphere, Mars'surface}}$$

Table1 Ratio between light mars : the moon and light mars : dark mars

element	λ(nm)	Area of the absorption line		
		Moon	Bright Mars	Dark Mars
Al	452.88	1.34	0.90	0.87
	466.69	0.82	0.78	0.76
sum		**2.16**	**1.68**	**1.63**
Ratio			**0.78**	**1.03**
N	453.00	0.64	2.10	1.89
Ratio			**3.28**	**1.11**
K	578.20	0.33	0.37	0.37
Ratio			1.21	1
Fe	495.77	0.69	0.79	0.59
	516.76	2.70	2.42	2.64
	532.79	0.91	1.17	1.19
	558.67	0.37	0.49	0.45
sum		**4.67**	**4.87**	**4.87**
Ratio			**1.04**	**1**
H	486.13	1.90	1.90	1.90
	656.26	2.07	2.07	2.07
sum		**3.97**	**3.97**	**3.97**
Ratio			**1**	**1**
Mg	518.40	1.00	0.95	0.95
Ratio			**0.95**	**1**
C	589.00	0.52	1.32	1.28
Ratio			**2.54**	**1.03**
Ni	547.70	-	0.58	0.56
Ratio			**-**	**1.04**

RESULTS

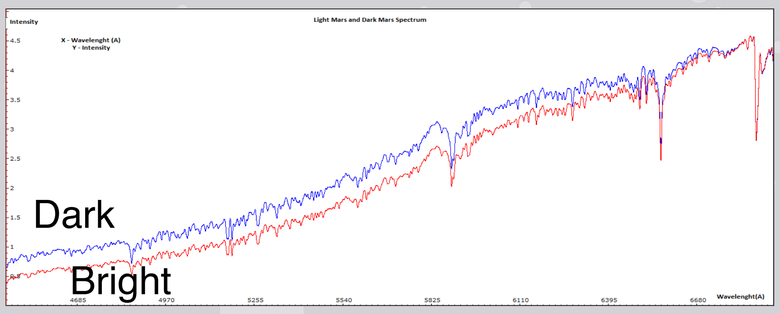


Bright area of mars

Moon

Fig.1 Comparison graph between bright area of the moon and mars.

From Fig.1 comparing the spectrum of Moon and the Mars, The author found that there are absorption lines of Al, K, N, C, H, Fe and Mg. For absorption lines of Ti and Th found only in the spectrum of the moon and absorption lines of Ni found only in the spectrum of mars.

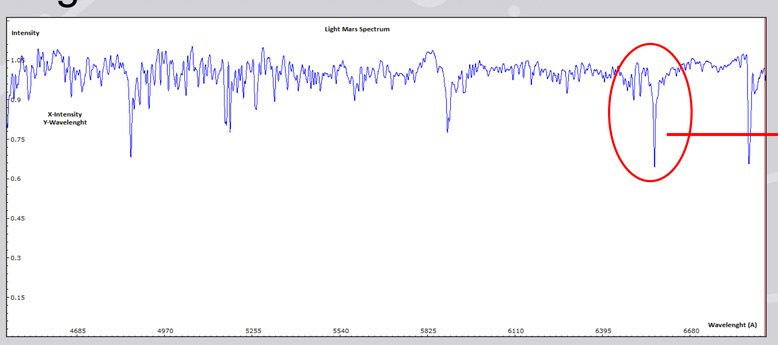


Bright area of mars

Dark area of mars

Fig. 2 Comparison graph between bright area and dark area of mars

From Fig.2 there are absorption lines of Al, H, N, Fe, Mg on bright and dark area of mars.



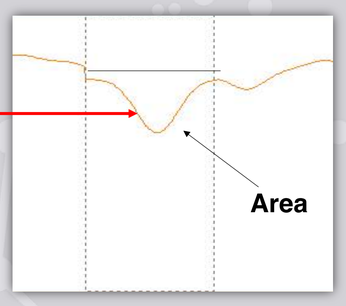


Fig.3 Normalize spectrum graphs and analysis ratio area of elements.

From Table 1 (Compering spectrum of the moon and mars)

1). The author found that Mars has strong absorption lines of Fe, N, K and C but weak absorption lines of Al and Mg.

2). There is stronger absorption lines of N from bright area the more than dark area on mars.

3).There are the similar absorption lines of H on the Moon and Mars. This indicates that H is not found on both objects.

CONCLUSIONS

The spectrum present spectrum of the moon and mars in different slope. Mars is higher slope than the moon. From the result can be explain that mars appear red. A chemical element analysis in Moon show absorption lines of Ti and Th and a chemical element analysis in mars show absorption lines of Ni.

A chemical element analysis in bright and dark area of mars show strong absorption lines of Al Ni C and N in bright area which is expected to be the atmosphere or light scattering in each area.

REFERENCE

Mars. [Online] Search from: http://nso.narit.ro.th/index.php/