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Some Features of Refractory Bricks Made of Mut (Mersin) and Meram (Konya) Magnesites

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ABSTRACT: The cost, resistance and quality of the industrial bricks are getting more and more important as the modern societies becoming more industrialized. The magnesite (as well as other components) is one of the most distinguished components in refractory bricks. Since it is give more resistance against temperature and external forces during many industrial products, such as steel. In this study we correlated two types of bricks: (1) The bricks essentially made of magnesites of Mut, and (2) Meram magnesites. The refractory bricks of Meram magnesites have 12.09 KN point load index test while the bricks of Mut magnesites have 13.69 KN point load index test. On the other hand the indirect tensile (Brazilian) test results are 18.53 KN and 22.01 KN for Meram and Mut respectively. These results reveal that the refractory bricks of Mut magnesites are much more resistance than the bricks of Meram magnesites.

Index Terms— magnesite bricks, mechanical-physical properties, Turkey

1 INTRODUCTION

As an industrial raw materials, magnesites were mostly found in three form, namely crystalline, cryptocrystalline and fine grained. The type of cryptocrystalline and fine grained magnesites are mostly related to often serpentinised ultramafic bodies (1,2,3,4) while crystalline types are formed within the dolomite and dolomitic carbonates (5,6,7). Their genesis and formation problems were investigated by their by isotopic signatures (8,9,10).

In this study, we correlated the physical-chemical properties of the bricks produced from Meram and Göcekler magnesites. The data at hand are mainly produced MSc thesis of Sözal (11). The location of the deposits were shown in Figure 1. We also revealed that the similarity of the magnesite deposits of Meram and Göcekler magnesite deposits.

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Figure 1. Location of the magnesite deposits.

2 GEOLOGY OF THE DEPOSITS

Cryptocrystalline-stockwork and sedimentary magnesite formations within the ultramafic terranes are widespread all over the world (12,13). The deposits of magnesites at Meram and Göcekler are both formed in an ultramafic environment. The host rocks are generally serpentinized peridotites (Figure 2) and the magnesites are in the form of cryptocrystalline. The magnesite deposits at Meram and Göcekler formed as veins and veinlets at most cases, and they form stockwork style formations (Figure 3).

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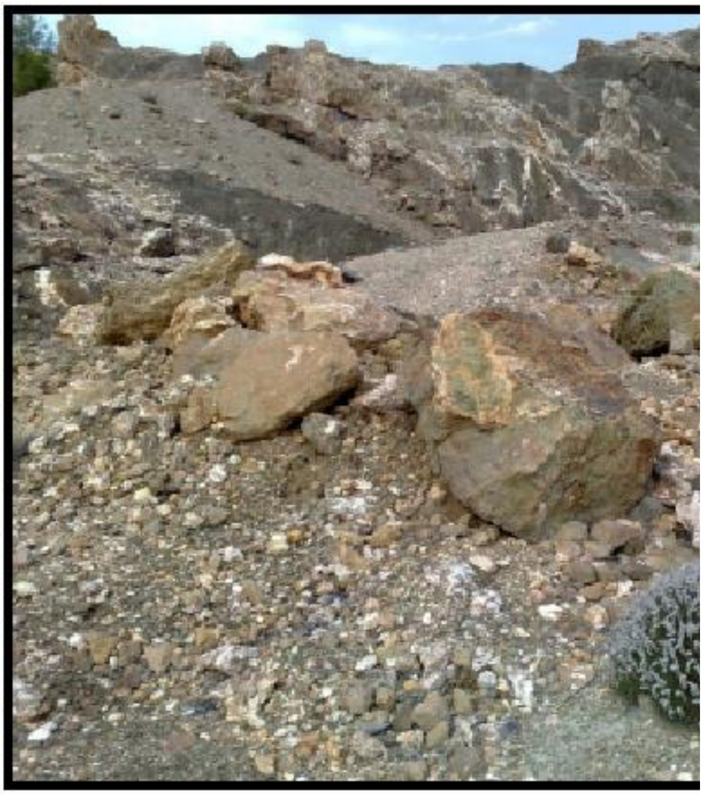

Figure 2. Serpentinized harzburgites with magnesite veins at Göcekler (Mut, Mersin) magnesite deposits.

Figure 3. Magnesite veins within the altered (or carbonated) serpentinites at Göcekler (Mut, Mersin).

3 RESULTS

In this study, we discussed some physical, chemical and geological features of magnesite bricks of Meram (Konya, Central Turkey) magnesites and Göcekler (Mut, Mersin, Central-South Turkey). In terms of type of ore formation as well as host-rock environments and the chemical composition, there has been no particular differences between the Meram and Göcekler magnesites (Table 1). The two magnesite bricks have also similar physical, for example porosity and density, properties. On the other hand the bricks made of Göcekler magnesites have 13.69 KN and 22.01 KN point loading (Table 2) and indirect pull test (Table 3) values respectively. Similar tests displays that the Meram magnesite bricks have this values 12.09 KN and 18.53 KN respectively.

Table 1. Chemical compositions of the bricks.

major oxides	brick of Meram	brick of Göcekler
MgO	93.95	94.75
Cr_2O_3	-	-
Al_2O_3	1.82	1.55
Fe_2O_3	0.75	0.95
SiO_2	1.90	0.80
CaO	1.58	1.95
total	100	100

Table 2. The results of point loading tests of the bricks of Meram magnesites and Göcekler magnesites.

sample no, (Meram)	(KN)	sample no (Göcekler)	(KN)
k1	11.25	m1	14.2
k2	11.10	m2	14.0
k3	9.95	m3	13.1
k4	12.90	m4	13.8
k5	14.90	m5	13.0
k6	13.20	m6	12.8
k7	11.60	m7	14.6
k8	11.80	m8	14.0

Table 3. Indirect pull-test results of the bricks produced from Meram and Göcekler magnesites.

sample no, Meram bricks	endirect pull-test (KN)	sample no, Göcekler bricks	endirect pull-test (KN)
ks1	14.4	md1	20.2
ks2	16.7	md2	20.4
ks3	15.5	md3	20.8
ks4	15.6	md4	17.9
ks5	15.0	md5	20.0
ks6	18.6	md6	18.4
ks7	15.2	md7	19.0
ks8	17.6	md8	19.6
ks9	19.6	md9	19.8

4 CONCLUSIONS

Both Meram and Göcekler magnesite deposits are formed as cryptocrystalline, vein-stockwork type of magnesite within the serpentinised ultramafics. Their chemical composition are also similar.

Our mechanical and physical tests reveals that the bricks produced from Göcekler magnesites are more resistant against pressure than the Meram magnesite bricks.

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