

**MnO<sub>2</sub>**

( )

- /

- /

**(NJC)**

( 2005 /10 /11 )

(2005/ 4 / 13 )

3 350

MnO<sub>2</sub>

3 25 ±550 ( )

**Abstract**

The research aimed to prepare activated carbon from Bituminous materials, Preparation of the samples has been conducted using air oxidation and MnO<sub>2</sub>. The oxidation was aimed to increase the amount of asphaltenes and asphaltic materials. The materials recovered from the oxidation after the removal of any materials having low carbon content i.e. highly volatiles are used in the study. Preparation of the carbon was carried out by mixing the Feedstock with LiOH, NaOH, KOH in ratio of [(1:2),(Raw materials:NaOH)] at 550±25°C for 3 hrs. The product Samples was evaluated by measuring Iodine number, Methylene Blue, Density, Ash content and Humidity content and compared with commercial carbon from B.D.H.

%(25 - 5 )

550

(5 ) Hamdon

(6) Aweed

(1)

(ZnCl<sub>2</sub> ,CoCl<sub>2</sub>,FeCl<sub>3</sub> )

(350-250)

%3-1

( 3-1 )

(2)

(7 )Al-Ghannam 550

(Morus nigra )

25±550

(8 )Al-Ghannam

(3)

350

-:

(4)Aweed

25 ± 550

V<sub>2</sub>O<sub>5</sub> %1

.3      <sup>(9)</sup> Anyadejwanich

(1)      500

.<sup>(12)</sup> (ASTMD36-70)

.4      . 850

)      <sup>(10)</sup> Yamaguchi

(

.1

.5      ( 350 )

)

(4)      . (MnO<sub>2</sub>)

(

550      )

(2:1)      (MnO<sub>2</sub>)

. (%5-1)

. 2

(1)

.6

(5)

(200)

( : ) (40:1)

(HCl) %10

. 24      120      ( )

.7

5

.<sup>(11)</sup>

(16)

0.1  
100

(20 ppm)

$$\frac{A}{C} = \left( \frac{A}{C} \right)^3 \quad (13)$$

3 1000

(14)

2

3 140

 $(\lambda_{\max}=665\text{nm})$ 

(15)

 $(\lambda_{\max}=665\text{nm})$ 

10

250

%5

(17)

.8

100

0.1

(0.2)

)

20

(5 - 4)

(

50

0.1

(3 - 2)

(100)  
(20)  
Crucible No(4)  
(HCl) (5)  
(3)  
(%5)  
(20 -15)  
Crucible No(4)

(18)

$$\frac{13.73 \times \text{BaSO}_4}{\quad} =$$



MnO<sub>2</sub>

(1)

]

[(4 )

(%4)

( MnO<sub>2</sub> )

)

. (

(375)

25±550 (2:1 )

3

MnO<sub>2</sub> %5

KOH

(19)

(20) LiOH NaOH

HCl

(21)

H<sub>2</sub>S

(3,2)

% (75 -70)

KOH > NaOH > LiOH

(23,22)

Li < Na < K

: (1)

**MnO<sub>2</sub>**

C	%	*	MnO <sub>2</sub>	
60	30.31		0	1
63	38.62		1	2
94	45.32		2	3
110	60.43		3	4
130	65.32		4	5
105	55.21		5	6

\*

**350**

: (2)

**3**

%	%	<sup>3</sup> /	/	/		
1.208	1.210	0.354	25	200	LiOH	1
0.891	1.621	0.343	60	339	NaOH	2
0.781	1.718	0.312	80	458	KOH	3

**(MnO<sub>2</sub>) %4**

: (3)

%	%	<sup>3</sup> /	/	/		
1.281	1.210	0.361	50	350	LiOH	5
1.289	1.250	0.300	100	786	NaOH	5
1.891	1.510	0.210	150	856	KOH	5
0.800	3.500	0.345	90	809	----	BDH

## References

- Green Wood , N. and Earnshaw ,A.," Chemistry of Elements " , Mc Graw – Hill , New York ,USA ,(1986).
- Norris , S.R., " Chemical Process Industrials ",4th ed ., New York , (1976) .
- Ramadhan, O.M. and Rigib, M.A., *J.Sci.& Edu.*, 2000 ,46 .
- Aweed ,K.A., Hamdon, A.A and Ramadhan,O.M., *J.Sci & Edu.*, 2005, Accepted.
- Hamdon,A.A.,Aweed, K.A. and AL-Dobone, S.A., *J.Sci. & Edu.*, 2005, Accepted.
- Aweed ,K.A., "Studying the Effect of Structural Modifications on the Production of Activated Carbon from Heavy Crude Oil Residues by chemical Treatment",Ph.D. Thesis , University of Mosul ,(2003).
- Al-Ghannam,K.A.,Aweed,K.A.and Hamdon,A.A., *J. National Journal of Chemistry* , 2004 , 13.
- Al-Ghannam,K.A., Ramadhan, O.M. and Hamdon,A.A., *J. Sci. & Edu.*, 2003, **41**,157.
- Anyandejwanich,p., *J.Carbon*, 2003, **41**, 157.
- Yamaguchi ,T., *J.Fuel*, 1980, **59**, 6 ,444.
- Ali,L.H.and AL-Ghannam ,K.A., *J.Fuel the Science and Technology of Fuel and Energy*,1981, **60** ,1034.
- ASTM Standard," Annual Book of American Society for Testing and Materials",part II(D36-70),P.27,(1971).
- ASTM D2854,70,"Standard Test Method for Apparent Density Activated Carbon".
- ASTM D2866-70,"Total Ash content of Activated Carbon ", Extracts Were Reprinted with Permission from the Annual Book of ASTM Standard Copyright ASTM Race Street,(1916).
- ISO,5.62-1981,"Determination of Volatile Matter Content of Hard Coal and Coke",The fuel Text Can be Obtained from ISO Central Secretariat Cose Postable 5G,CH-1211: Genra 20 or from any ISO Member.
- AWWA Standard for Granular Activated Carbon, B604-74, Sec . 7 , Approved by J. the American Water Works Association Board of Directors on Jan.28,(1974).
- " Test Metods for Activated Carbon",Rosterban Int.Engineering GMBH,W.Germany Devtschos Aizneibuch,6thed.

18. Rittner, R.C., "Modern Organic Elemental Analysis", New York, P.221(1974).
19. Teng, H.S. and Weng, T.S., *J. Microporous Mesoporous Mat.*, 2001, **50**, 1, 53.
20. Jeffery, C., *J. Fuel the Science and Technology of Fuel and Energy*, 1980, **159**, 6, 425.
21. OM, P., Philip, L and Walker, Jr., *J. Fuel*, 1979, **58**, 333.
22. United State Patent, 4,286,972, Sept.(1981).
23. Shahab, Y.A., Siddiq, A.A. and Tawfiq, K.S., *J. Pet. Res.*, 1988, **7**, 1, 209.