

Let A , B be both this square, by means of proceeding method a pandiagonal magic square of order 25 can be generated.

Example 2. Let

$$A = \begin{array}{|c|c|c|c|} \hline 4 & 5 & 10 & 15 \\ \hline 9 & 16 & 3 & 6 \\ \hline 7 & 2 & 13 & 12 \\ \hline 14 & 11 & 8 & 1 \\ \hline \end{array}$$

$$B = \begin{array}{|c|c|c|c|c|c|c|c|} \hline 1 & 3 & 54 & 56 & 25 & 27 & 46 & 48 \\ \hline 2 & 4 & 53 & 55 & 26 & 28 & 45 & 47 \\ \hline 31 & 29 & 44 & 42 & 7 & 5 & 52 & 50 \\ \hline 32 & 30 & 43 & 41 & 8 & 6 & 51 & 49 \\ \hline 40 & 38 & 19 & 17 & 64 & 62 & 11 & 9 \\ \hline 39 & 37 & 20 & 18 & 63 & 61 & 12 & 10 \\ \hline 58 & 60 & 13 & 15 & 34 & 36 & 21 & 23 \\ \hline 57 & 59 & 14 & 16 & 33 & 35 & 22 & 24 \\ \hline \end{array}$$

We can obtain a pandiagonal magic square of order 32.

Acknowledgement

The author would like to thank Prof. Min Lequan for his beneficial help.

References

- 1 Albert L. Candy, Construction, Classification and Census of Magic Squares of Order Five. Second Edition. Michigan: Edwards Brothers Inc, 1939
- 2 Denes J, Reedwell A D. Latin Squares and Their Applications. New York, London: Academic Press, 1974
- 3 Liao Fucheng. Journal of Univ of Sci and Tech Beijing (in Chinese), 1992, 14(6): 594
- 4 Liao Fucheng. Acta Scientiarum Naturalium Universitatis Neimonggol (in Chinese), 1996, 27(2): 154

~~~~~

## Determination of CaO in Baotou Columbite and Steel Cinder with Flame Atomic Absorption Spectrometry

LI Jianqiang

Applied Science School, USTB, Beijing 100083, China

**Abstract:** The determination of CaO content in columbite and steel cinder with flame atomic absorption spectrometry is studied. EDTA+TEA is used to eliminate the interferences, in HCl media, with La as releaser. The methods of sample treatment and the CaO in remainder undissolved in acids have been conducted. The result of the determination and recovery of CaO shows that the rate of recovery is 100% ~ 102%, R.S.D < 2%.

**Key words:** atomic absorption spectrometry, CaO, columbite, steel cinder

## Dissolution Equilibrium of Bismuth Vapor in Liquid Iron and the Interaction Effect of Third Element

SONG Bo ZHAO Baodong HAN Qiyong

Applied Science School, USTB, Beijing 100083, China

**Abstract:** The dissolution equilibrium of Bi vapor in liquid iron and the interaction effect of third element were conducted in a sealed Mo reaction chamber by vapor pressure method. The relationship between the standard solution Gibbs free energy of Bi in liquid iron and temperature obtained can be expressed. The interaction coefficients of third elements on Bismuth in liquid iron at 1873 K can be deduced.

**Key words:** bismuth, liquid iron, thermodynamic parameters, impurity

(from Journal of USTB (in Chinese), 1997, Vol.19, No.2)

~~~~~