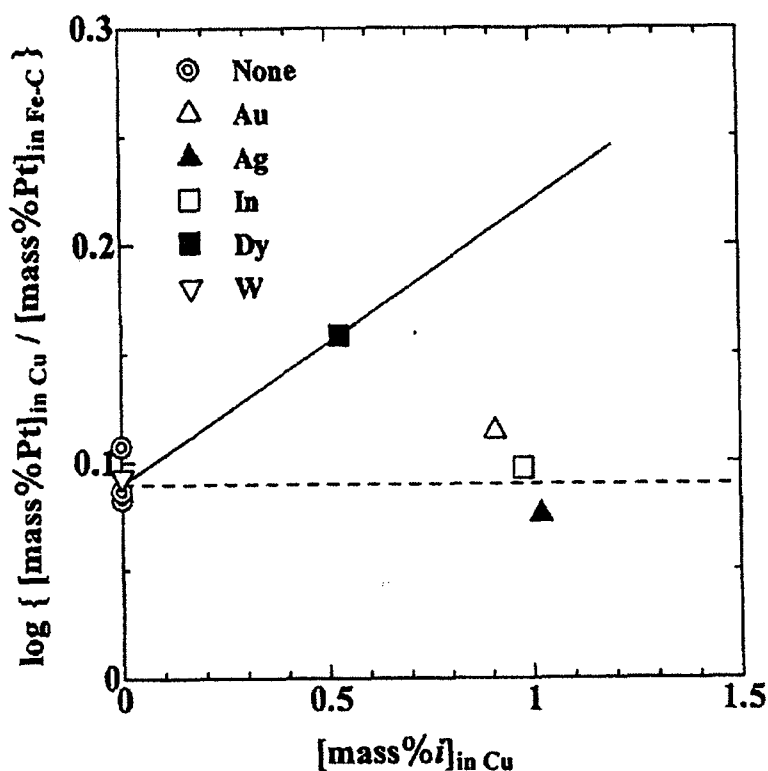


METHOD FOR EFFICIENTLY RECOVERING PLATINUM GROUP ELEMENTS FROM COPPER-IRON SCRAP

ABSTRACT

The present invention provides a means for efficiently recovering a platinum group element by efficiently concentrating it in a molten copper phase obtained from copper-iron scrap containing a platinum group element. It is a method comprising melting copper-iron scrap containing a platinum group element, forming the melt into two liquid phases, a molten copper phase containing at least one rare metal selected from the group consisting of Nd, Pr, and Dy and a molten iron phase having a carbon concentration of at least 1 mass %, with the carbon contained in the molten iron phase being derived from carbon contained in the melt, separating the two liquid phases and recovering the molten copper phase, and separating and recovering from the molten copper phase a platinum group element dissolved therein. The copper-iron scrap may contain a rare metal, or a member containing a rare metal may be added to the melt. The total concentration of rare metals contained in the melt is preferably at least 1 mass %.

Fig. 1



We claim:

1. A method of recovering a platinum group element in copper-iron scrap characterized by
melting copper-iron scrap containing a platinum group element to form a melt,
forming the melt into two liquid phases which are a molten copper phase containing at least one rare metal selected from the group consisting of Nd, Pr, and Dy and a molten iron phase having a carbon concentration of at least 1 mass %, wherein the carbon contained in the molten iron phase is derived from a carbon source contained in the melt,
separating the two liquid phases and recovering the molten copper phase, and
separating and recovering a platinum group element dissolved in the molten copper phase from the molten copper phase.
2. A method as set forth in claim 1 wherein the molten copper phase containing the rare metal is formed by using scrap containing the rare metal as the copper-iron scrap.
3. A method as set forth in claim 1 wherein the molten copper phase containing the rare metal is formed by adding a member containing the rare metal to the melt.
4. A method as set forth in claim 1 wherein the total concentration of the rare metal contained in the molten copper phase is at least 1 mass %.
5. A method as set forth in claim 1, wherein
the melt contains at least one distribution promoting element selected from the group consisting of Sc, Li, Ca, Mg, Y, La, K, Sr, Th, Ga, Ba, Na, and Rb, and/or at least one distribution inhibiting element selected from the group consisting of Ti, Zr, Hf, Nb, V, U, and Ta, and

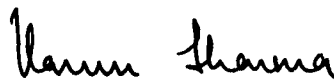
the two liquid phases which are the molten copper phase and the molten iron phase and into which the melt is separated satisfy the following Equation (i):

$$2.2\text{Sc} + 1.7\text{Li} + 1.4\text{Ca} + 1.2\text{Mg} + 1.2\text{Y} + \text{Nd} + \text{Pr} + 0.87\text{Dy} + 0.79\text{La} + 0.78\text{K} + 0.74\text{Sr} + 0.61\text{Th} + 0.52\text{Ga} + 0.51\text{Ga} + 0.50\text{Na} + 0.45\text{Rb} + 0.36\text{Pu} + 0.35\text{Cs} + 0.24\text{Sn} + 0.23\text{In} + 0.23\text{Zn} - (1.2\text{Ti} + 1.2\text{Zr} + 0.51\text{Hf} + 0.49\text{Nb} + 0.29\text{V} + 0.29\text{U} + 0.25\text{Ta}) > 1.0 \text{ mass \%} \quad (\text{i})$$

wherein, the symbol for each element in Equation (i) indicates the mass concentration (units of mass percent) of the corresponding element in the molten copper phase with respect to the mass of the molten copper phase in the case of the distribution promoting metals and the rare metals and indicates the mass concentration (units of mass percent) of the corresponding element in the molten iron phase in the case of the distribution inhibiting metals with respect to the mass of the molten iron phase.

Dated this 25th day of July, 2012.

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ORIGINAL

SUMITOMO METAL INDUSTRIES, LTD.

TOTAL NO. OF SHEETS: 1
SHEET 1 of 1

6572 DELNP 12
25 JUL 2012

Fig. 1

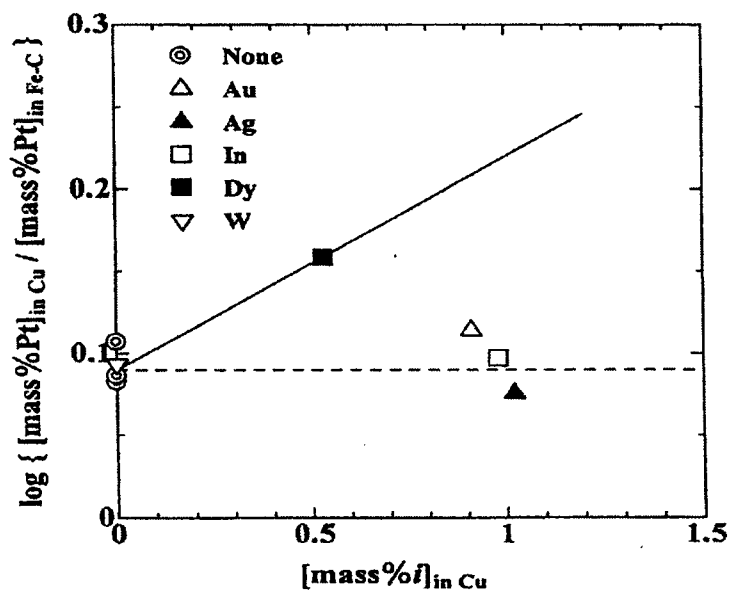
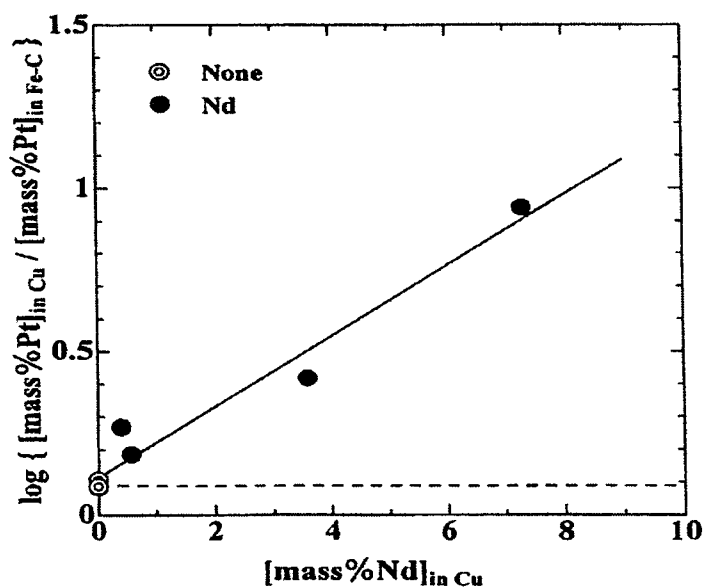


Fig. 2



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