

LBMA Assaying & Refining Conference 2017

LPPM Certified Reference Material

2017/3/21

Hiroshi Sawai

Planning & Development Office
TKG Laboratory Center

Our Profile

- Tanaka Kikinzoku Group is a leading Japanese company in the field of precious metals with a history well over a hundred years.
- The group is also producer and trader of a variety of materials of bullion and platinum group metals, coins and bars which are acceptable 'good delivery' on most markets and exchanges such as London, New York and Tokyo.
- The group is also active environmentally, and is one of the world largest recyclers of platinum group metals.

Agenda

1. Brief History of LPPM
2. General information of LPPM
3. Importance of CRMs.
4. Project information in general
5. Material of RM
6. Melting and Casting
7. Rolling and Cutting
8. Homogeneity Checking
9. Quantitative analysis of trace elements
10. LPPM CRMs Elements concentration
11. Conclusion



LBMA
GOOD DELIVERY
REFEREE



THE LONDON
PLATINUM
& PALLADIUM
MARKET

1. Brief History of LPPM



In 1973

The London Platinum Quotation was introduced. It was the forerunner of the fixings; a twice-daily indication of the market price for spot platinum, reported by some of the principal companies dealing in the metal.

In 1979

The leading London and Zurich dealers reached an agreement to standardise the specifications and provenance of metal which they would accept as good delivery.

In 1987

The informal trading which had taken place for many years on a principal to principal basis was formalised via a Deed of Establishment into the London Platinum and Palladium Market.

In 1989

The London Platinum and Palladium Quotations were expanded and upgraded to full Fixings.

In 2014

The LBMA Platinum price and the LBMA Palladium price was launched under the administration of London Metal Exchange, with the agreement of the London Bullion Market Association.

2. General Information of LPPM

1. LPPM promotes quality and good practices in the area of platinum and palladium refining and trade.
2. The production and the sale of the Reference materials referred to herein represents part of the effort.
3. This Reference Materials was produced by Tanaka on behalf of the LPPM, under the guidance of the LPPM Referees, the LPPM Consultants and Dr. Mike Hinds of RCM.
4. The composition reflects the needs expressed by LPPM accredited refiners.

3.Importance of CRMs.

1. CRMs can be used by the laboratories of refiners and spectrometry instrument manufacturers to validate their existing methods and test materials (used for spectrometer calibration).
2. Each laboratory can use CRMs to validate or assess the assay result of Pt and Pd.
3. By having a set of internationally CRMs, each laboratory will have the ability to compare, and if required, certify their in-house reference materials against CRMs, which will provide the most accurate reference concentration values available.
4. LPPM believes that the use of CRMs by refiners would be beneficial in the current ISO 17025 environment as well.

4. Project information in general

1. Steering Committee members

LPPM + 5 Good Delivery(GD) Referees

2. Manufactured by (Both Pt and Pd)

Tanaka Kikinzoku Kogyo K.K.(TKK)

3. Homogeneity Checking

TKK and Metalor Technologies

4. Assayed by 5 GD Referees + 5 skilled Laboratories;

Anglo American Platinum , Argor-Hereous, BASF,
Cendres+Metaux, Hereaus, Johnson Matthey,
Metalor Technologies, PAMP, TKK, Valcambi

5. Adviser on Statistics

Dr.Mike Hinds (Royal Canadian Mint)

6. Inquires in general

LPPM or 5 GD Referees



THE LONDON
PLATINUM
& PALLADIUM
MARKET

5. Material of RM



Pure Pt
Sponge



Pure Pt Ingot



Master Alloys on Pt matrices

6. Melting and Casting



Melting start



**Injection of
Master Alloy**

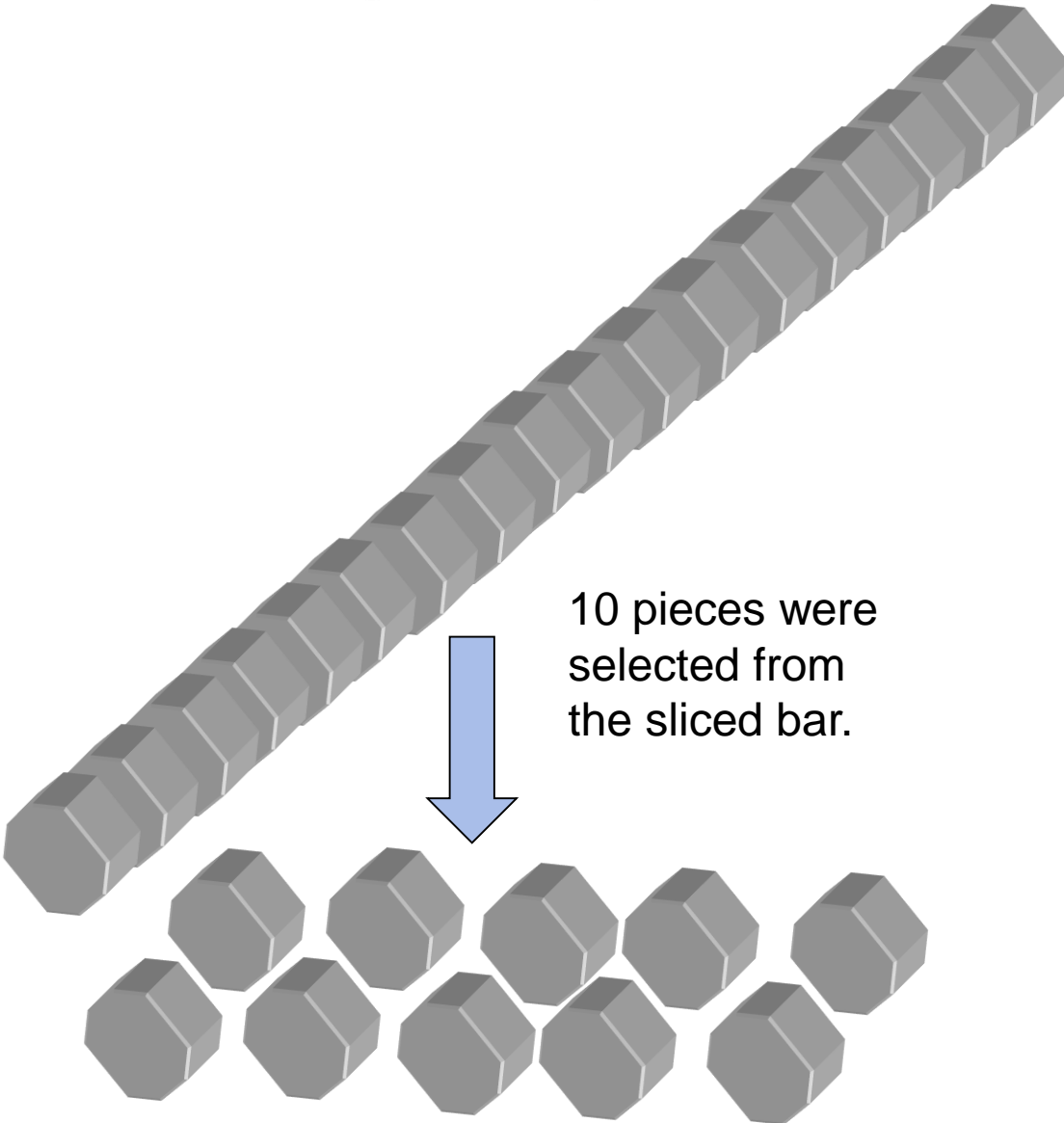


Casting

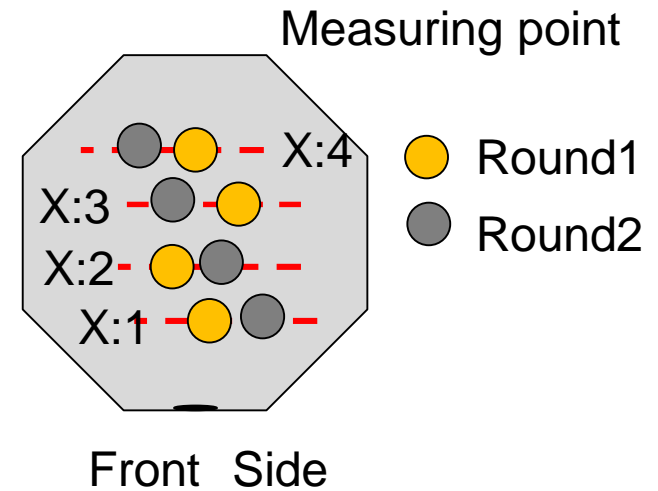
7. Rolling and Cutting



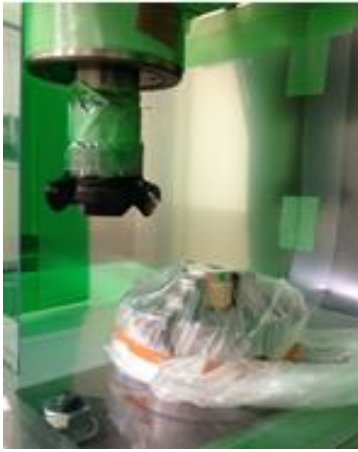
8. Homogeneity Checking



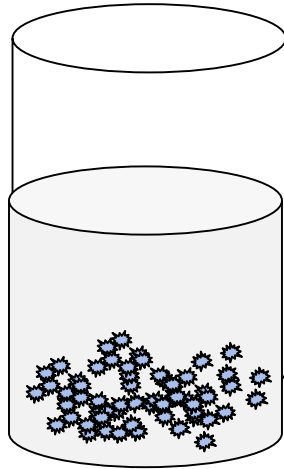
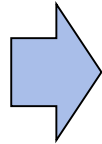
Measure using Spark-OES



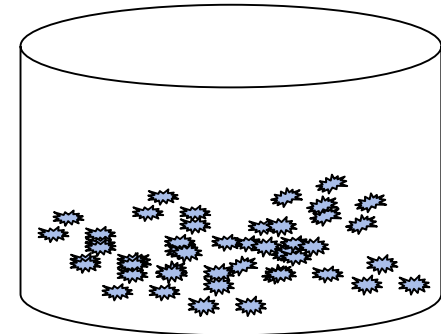
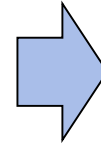
9. Quantitative analysis of trace elements



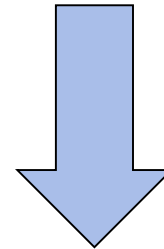
Shaving



Acid washing



Drying
& Sampling



Distributed 10 Labs for analysis

10. LPPM CRMs Element concentrations(mg/kg)

	Pt-RM1	Pt-RM2
Ag	13.9±1.3	44.8±4.5
Al	93.9±7.1	34.7±4.4
As	58.2±5.4	28.7±6
Au	11.1±2.4	51.9±6
Bi		18.6±2
Co		19.5±1.4
Cr	9.3±0.5	47.2±1.7
Cu	26.1±1.5	90.8±5.4
Fe	12.4±1.8	85.4±7.9
Ir	204±17	59.2±7
Ni	11.1±2.3	41.4±3.6
Pb	12.3±3.0	33.3±3.7
Pd	10.5±1.3	95.3±5.9
Rh	13.7±2.4	101.6±5.1
Ru	11.4±1.4	51.5±3.9
Sb	19.5±2.3	49.9±6
Si	47.5±4.9	13.1±3.7
Sn	47.6±5	7±3.1
Ti		11.8±0.8
Tl	6.2±0.8	39.2±6.1
W		20.2±1.5
Zn	9.5±1.0	9.5±0.5
Zr		36.5±3.8

	Pd-RM1	Pd-RM2
Ag	11.1±2.3	95.5±7.9
Al	12.4±1.9	5.0±1.3
Au	99.2±5.7	16.0±2.3
B	2.5±0.6	
Ca		9.5±2.0
Co		17.5±1.1
Cr	45.5±1.9	9.3±1.5
Cu	11.0±2.0	92.1±4.4
Fe	11.1±1.9	45.1±2.8
Ga		18.6±2.3
Ir	9.7±2.5	43.4±5.7
Mg	22.3±0.9	
Mn	23.8±1.2	
Ni	54.1±2.9	10.1±0.9
P		
Pb	13.2±2.2	66.0±5.0
Pt	54.4±2.9	228.0±13.0
Rh	56.3±3.4	13.3±1.2
Ru	10.3±0.9	45.1±3.4
Sb	9.2±1.1	42.8±5.0
Si	50±11.0	119.0±29.0
Sn	12.3±1.9	44.4±5.2
Zn	9.5±1.0	17.4±1.4
Zr		10.8±1.9



11. Conclusion

- These CRMs are available for sale from LPPM.
- The excellent group of laboratories had purchased and been making the best use of the CRMs.
- By having these materials at your plants or assay offices, you will get more confidence on your results by getting a validation of accuracy on your assay method and results.
- These materials and its procedure will help the PGM market, regulated by LPPM, retain its dignity and reliability.
- There are some more for sale at LPPM office.
- Please join us by acquiring them to change the market toward the right direction and make your business more fruitful.



*Thank you for your attention.
Please send any inquiries*

to

Mt.Fuji
World Cultural Heritage

h-sawai@ml.tanaka.co.jp



LBMA
GOOD DELIVERY
REFEREE