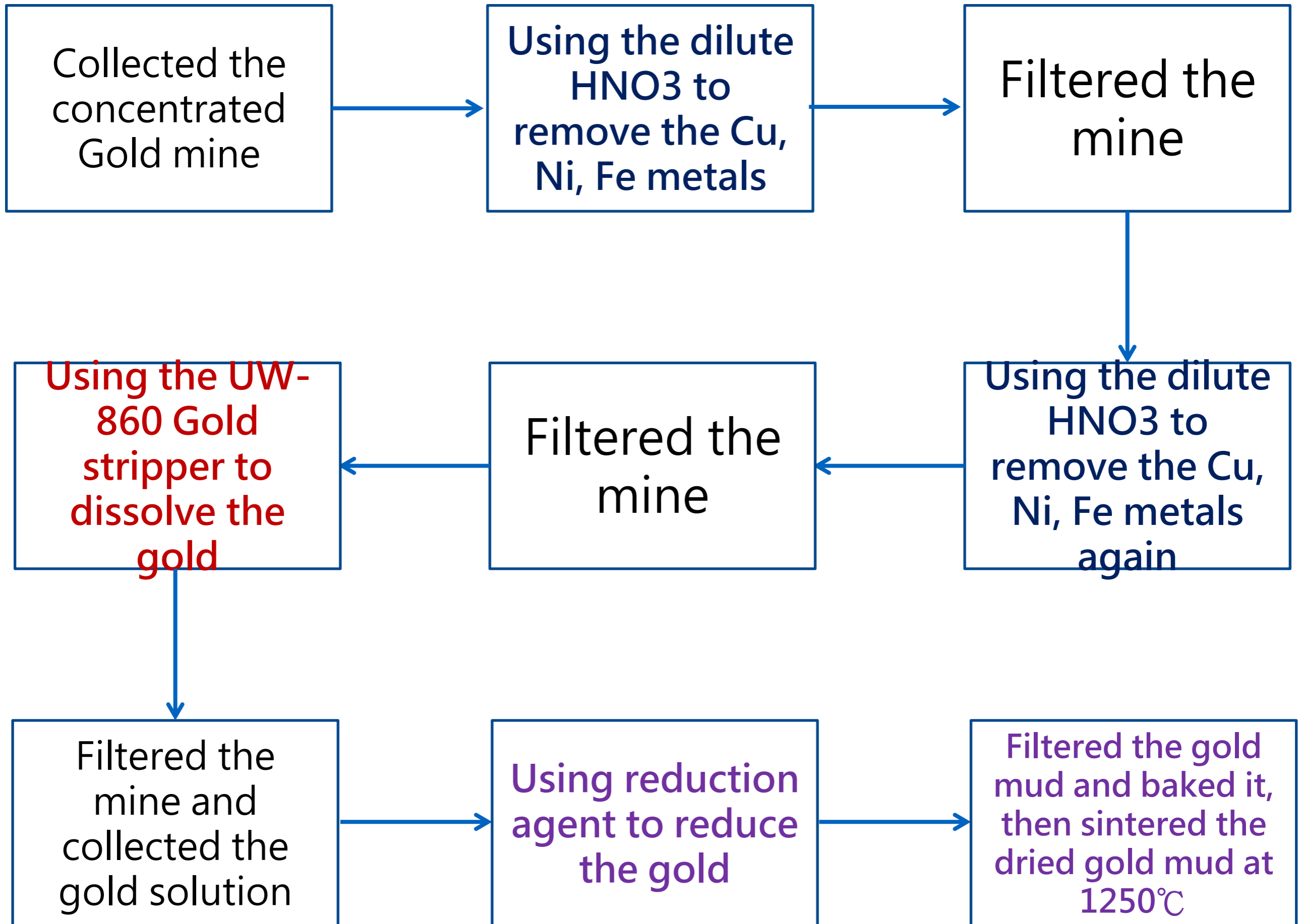


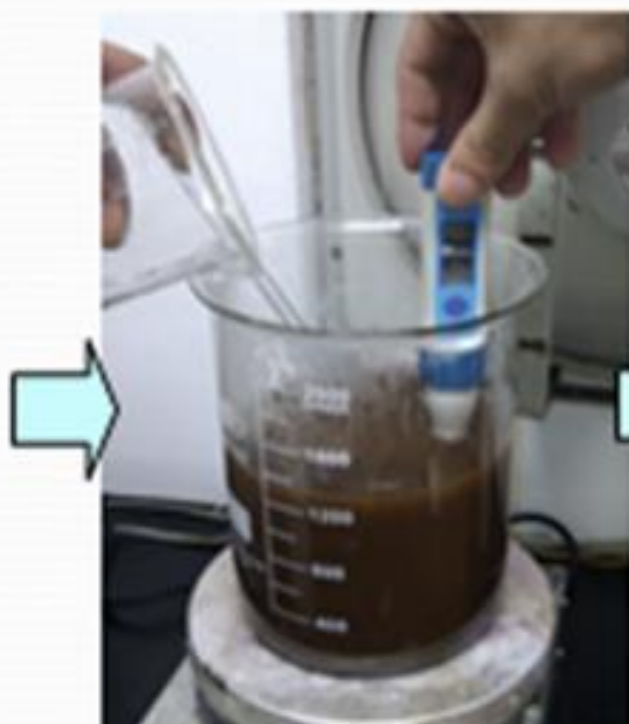
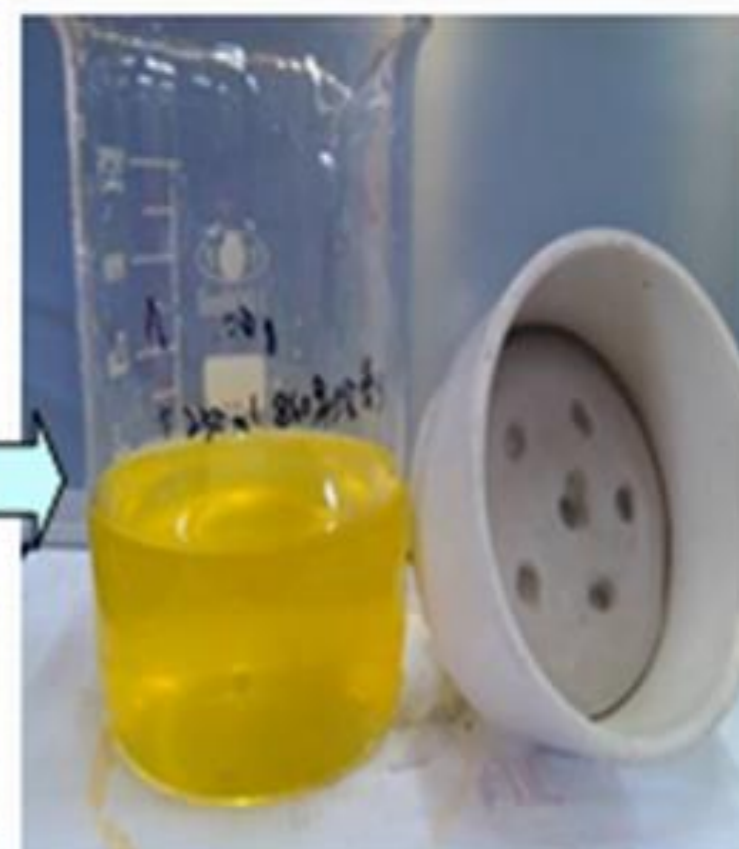
Recycling gold from gold mine





Gold Mine Case 1

1. Using eco-friendly UW-860 gold stripper to extract gold from mine.
2. Without any mercury or cyanide.
3. ICP test result : 9.6 g Au/ton



Gold Mine Case 2

Crushing Process



Element Weight Percentage

	Zn (%)	Fe (%)	Si (%)	As (%)	Cu (%)	Mn (%)	Pb (%)	Cd (%)
A	60.4	18.05	12.55	2.73	2.453	1.950	1.040	0.528
B	8.725	66	20.1	0.2675	1.275	1.2	1.0125	0.0014
	以下空白							
	Co (%)	Au (%)	Pt (%)	Sn (%)	Br (%)	Ag (%)	Hg (%)	
A	0.0627	0.0596	0.062	0.0269	0.0222	0.009	ND	
B	0.5915	0.3095	0.241	0.0449	ND	0.0242	0.257	

UW-860 Process



Using HNO_3 to remove Cu, Ni, Zn, Fe from gold ore

Then, Using UW-860 stripper to extract the gold from gold ore.



ICP Result

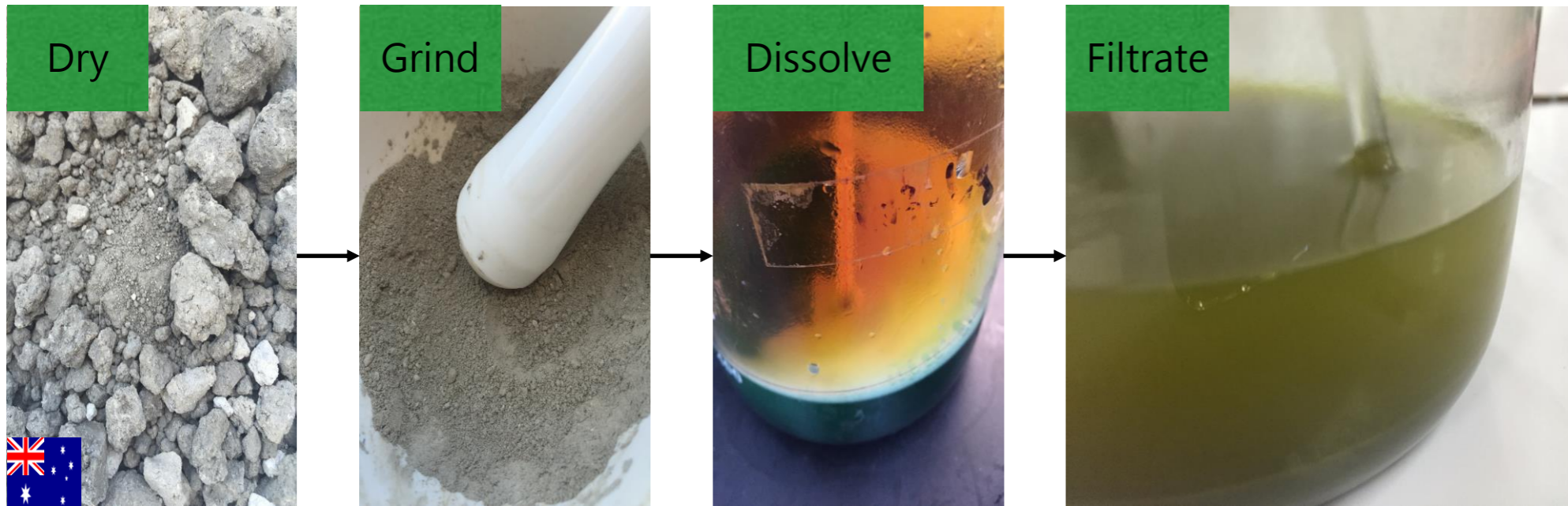
Indonesia: 41.23 g Au/Ton

North Korea: 31.84 g Au/Ton

Gold Mine Case 3

Refractory Gold

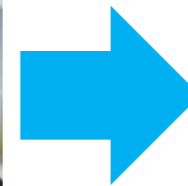
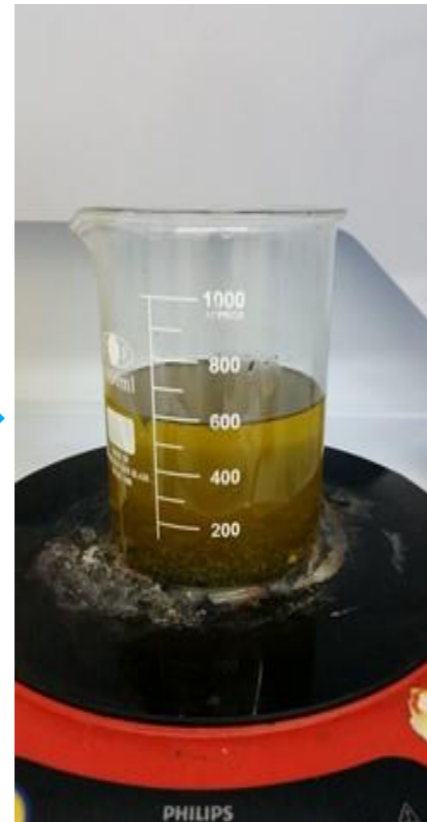
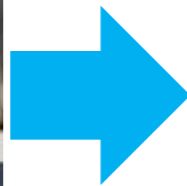
XRF test



1. XRF test result :
Au (0.0122%) ,
Si (6.25%) ,
S (0.538%)
2. ICP test result :
• **230 g Au/Ton**

No.	Component	Result	Unit
1	Fe	83.5	mass%
2	Si	6.25	mass%
3	Ca	5.81	mass%
4	K	1.55	mass%
5	Al	1.40	mass%
6	S	0.538	mass%
7	As	0.333	mass%
8	Ba	0.194	mass%
9	Pb	0.0902	mass%
10	Th	0.0887	mass%
11	Ir	0.0531	mass%
12	Ta	0.0474	mass%
13	Sr	0.0352	mass%
14	Mn	0.0270	mass%
15	Rb	0.0236	mass%
16	Sn	0.0233	mass%
17	Ag	0.0198	mass%
18	Au	0.0122	mass%
19	Sb	(0.0055)	mass%
20	Zn	ND	mass%
21	Ni	ND	mass%
22	Y	ND	mass%
23	Hf	ND	mass%
24	Cu	ND	mass%
25	Ga	ND	mass%
26	U	ND	mass%
27	Br	ND	mass%
28	Co	ND	mass%
29	Ti	ND	mass%
30	V	ND	mass%
31	Cr	ND	mass%
32	Mg	ND	mass%
33	P	ND	mass%
34	Cl	ND	mass%
35	Ge	ND	mass%

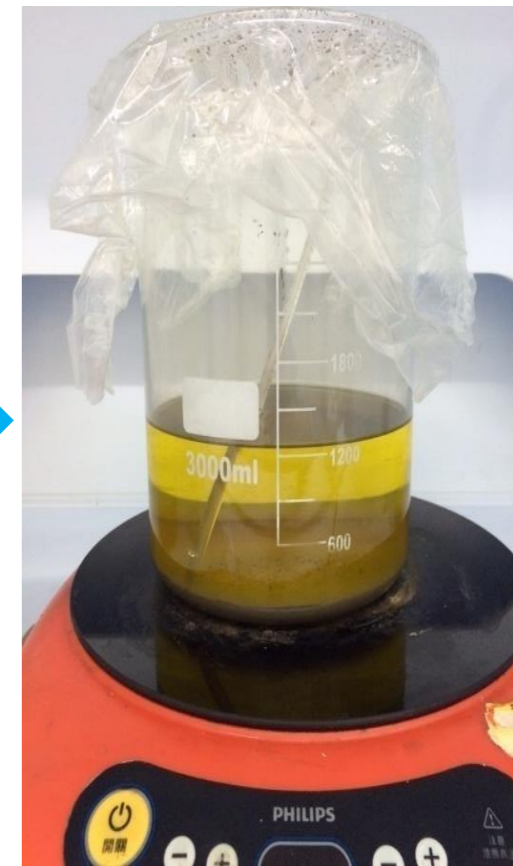
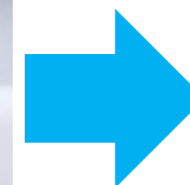
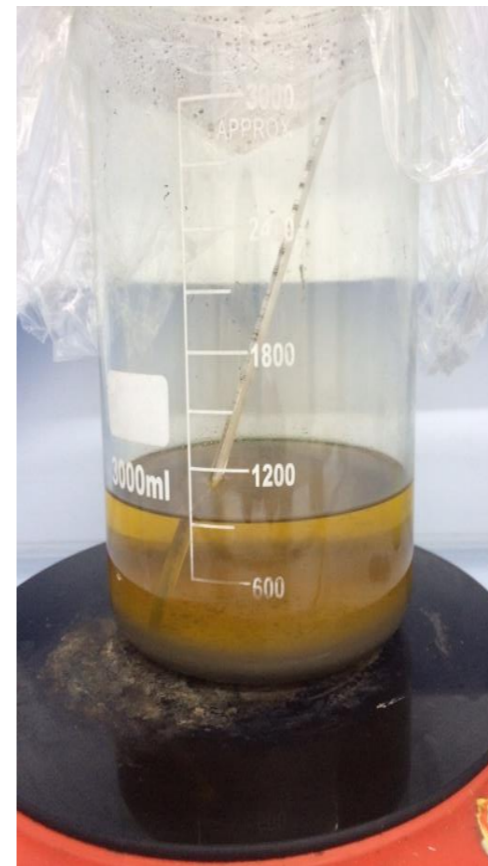
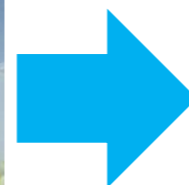
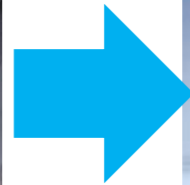
Gold Mine Case 4



Philippine

- ICP analysis
=> 23 g Au/Ton

Gold Mine Case 5



Falkland Islands

- ICP analysis
=> 140 g Au/Ton

XRF Test (Before treatment)

Analyzed result						
Sample name	Y15224	Date	8/19/2015 4:57 PM			
File name	PowderY15224	Counts	1			
Application	Powder	Sample model	Bulk			
No.	Component	Result	Unit	Statistical error	Detection limit	Quantitation limit
1	Sn	50.4	mass%	0.129	0.140	0.420
2	Ta	19.0	mass%	0.0482	0.0239	0.0717
3	Fe	9.49	mass%	0.0087	0.0151	0.0454
4	Nb	9.09	mass%	0.0332	0.0114	0.0341
5	Ti	4.36	mass%	0.0222	0.0141	0.0422
6	Mn	1.22	mass%	0.0085	0.0063	0.0189
7	Si	1.04	mass%	0.0352	0.0754	0.226
8	P	1.03	mass%	0.0139	0.0262	0.0786
9	Ce	0.784	mass%	0.0248	0.0377	0.113
10	Th	0.531	mass%	0.0043	0.0049	0.0148
11	Pb	0.522	mass%	0.0051	0.0060	0.0181
12	Cu	0.344	mass%	0.0172	0.0465	0.140
13	U	0.330	mass%	0.0031	0.0009	0.0028
14	Y	0.197	mass%	0.0016	0.0010	0.0029
15	Ge	0.194	mass%	0.0041	0.0099	0.0297
16	La	0.192	mass%	0.0134	0.0273	0.0819
17	Ni	0.181	mass%	0.0040	0.0072	0.0215
18	Nd	(0.180)	mass%	0.0296	0.0765	0.230
19	Co	0.150	mass%	0.0052	0.0191	0.0574
20	Ir	0.134	mass%	0.0144	0.0424	0.127
21	K	(0.128)	mass%	0.0302	0.0898	0.270
23	Au	0.110	mass%	0.0053	0.0142	0.0426
24	V	0.0702	mass%	0.0074	0.0211	0.0634
25	S	0.0658	mass%	0.0056	0.0155	0.0465
26	Hg	0.0384	mass%	0.0028	0.0064	0.0192
27	Cr	0.0323	mass%	0.0025	0.0064	0.0193
28	Pt	ND	mass%	0.0102	0.0304	0.0913

XRF Test (After treatment)

Page 1/2

Analyzed result						
Sample name	Y15227_T-0825-01			Date	8/25/2015 5:00 PM	
File name	PowderY15227_T-0825-01			Counts	1	
Application	Powder			Sample model	Bulk	
No.	Component	Result	Unit	Statistical error	Detection limit	Quantitation limit
1	Sn	46.3	mass%	0.122	0.125	0.375
2	Ta	29.9	mass%	0.0501	0.104	0.313
3	Nb	11.0	mass%	0.0404	0.0122	0.0367
4	Fe	4.32	mass%	0.0097	0.0144	0.0433
5	Ti	3.61	mass%	0.0204	0.0068	0.0203
6	Si	1.64	mass%	0.0326	0.0304	0.0913
7	Mn	1.13	mass%	0.0089	0.0102	0.0307
8	Cu	0.383	mass%	0.0150	0.0411	0.123
9	S	0.273	mass%	0.0049	0.0061	0.0184
10	U	0.230	mass%	0.0028	0.0036	0.0109
11	P	0.197	mass%	0.0063	0.0106	0.0318
12	Ge	0.170	mass%	0.0038	0.0093	0.0280
13	Ni	0.143	mass%	0.0031	0.0055	0.0166
14	Ga	0.133	mass%	0.0076	0.0166	0.0499
15	Th	0.117	mass%	0.0022	0.0036	0.0109
16	Co	0.111	mass%	0.0038	0.0110	0.0331
17	Y	0.103	mass%	0.0013	0.0022	0.0066
18	Pb	0.100	mass%	0.0030	0.0070	0.0211
19	K	ND	mass%	0.0329	0.0981	0.294
20	Au	(0.0264)	mass%	0.0052	0.0151	0.0454

Gold Mine
Case 6

China Nanning(南寧) Ore



100 g Ore



Nitric Acid
pretreatment



Filtration



UW-860
treatment



Filtration

- **ICP**

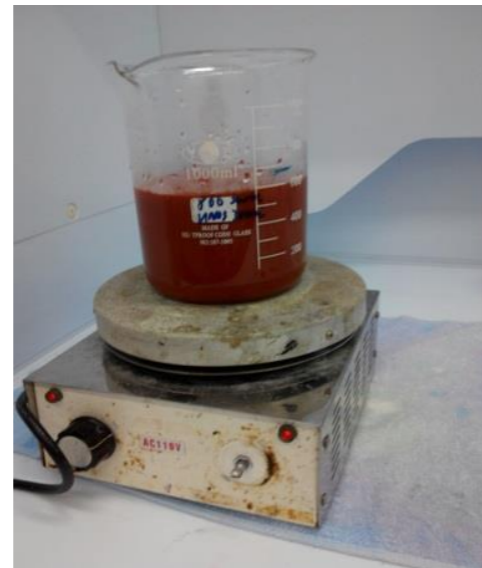
- Ore B - 3.78 g Au/Ton
- Ore C - 2.08 g Au/Ton

Gold Mine Case 7

China Kansu(甘肅) Ore



51.38 g Ore



Nitric Acid
pretreatment



Filtration



UW-860
treatment

- **ICP analysis**
=> 6.42 g Au/Ton

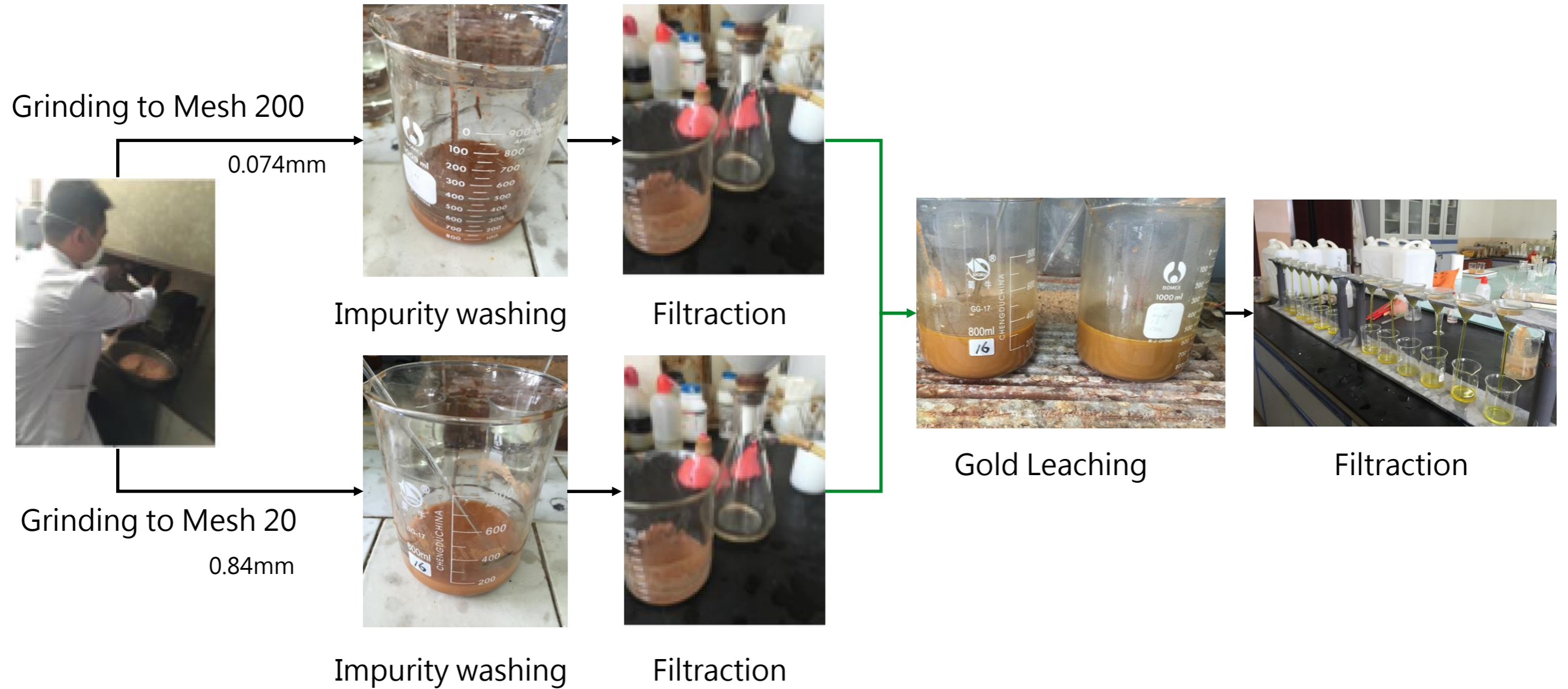
Gold Mine
Case 8



Gold Ore Test Report

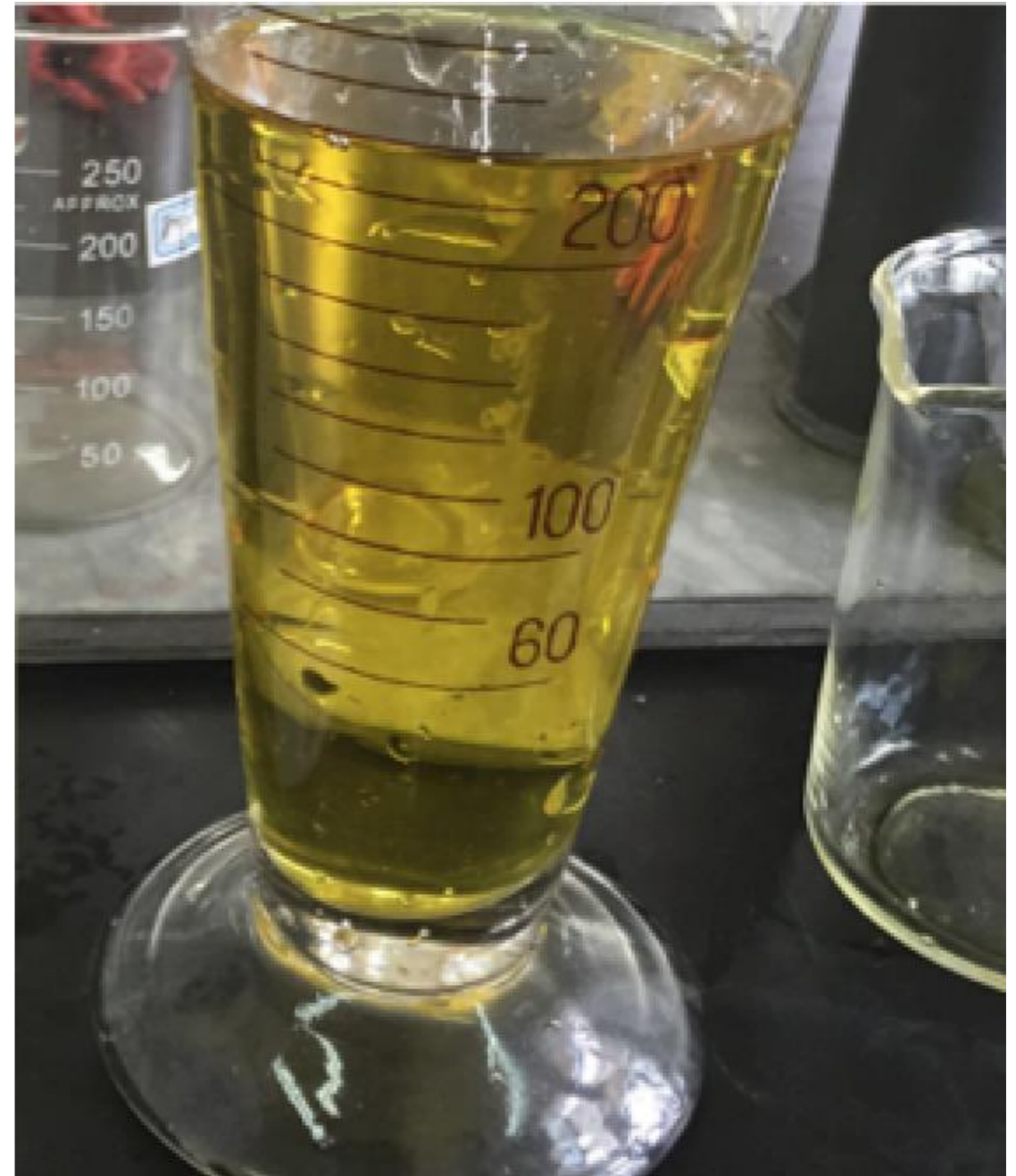
西雙版納(Xishuangbanna)

Leaching Process



Result

- China AAS analysis
20 mesh - 0.523 g Au/Ton
200 mesh - 0.503 g Au/Ton
- **Taiwan ICP analysis**
20 mesh - 0.682 g Au/Ton
200 mesh - 0.744 g Au/Ton



Comparison Table

Item	Aqua Regia	Cyanide	Mercury	UW-860 Eco Gold stripper
Effectiveness	Substrate fully dissolved	Recovery Gold	Only recovery gold	Recovery Au, Pd, Pt, Ir
Saturation	<0.5 g/L	0.6~2 g/L	<0.5 g/L	2~7 g/L
Extract rate	Medium (12~36 hr)	Slow (48~72 hr)	Very slow (48~96 hr)	Fast (4~8 hr)
Ingredients	HNO ₃ + HCl (1:3 v/v)	NaCN + Lead acetate	Mercury	HNO ₃ + UW-860 (1:1 v/v)
Corrosiveness	High	Medium	Medium	Medium
Safety	Highly acidic with chloride toxic	Highly toxic	Mercury vapor highly toxic	Acidic
Waste treatment	Requires huge amounts of alkaline to neutralize	Require to treat cyanide and Lead	Require to treat mercury residues	Use alkaline to neutralize

Analysis instrument

Analysis Test Item

- Liquid sample- **ICP**
- Solid sample - **XRF**

● X-Ray Fluorescence spectrometry(**XRF**)



Analysis item :
Metal content of Solid material or powder

● Inductively Coupled Plasma(**ICP**)



Analysis item :
Metal ion of Au, Ag, Pd, Pt, Sn, Ni, Cu, In, Fe, Al, Zn.

Stirring One

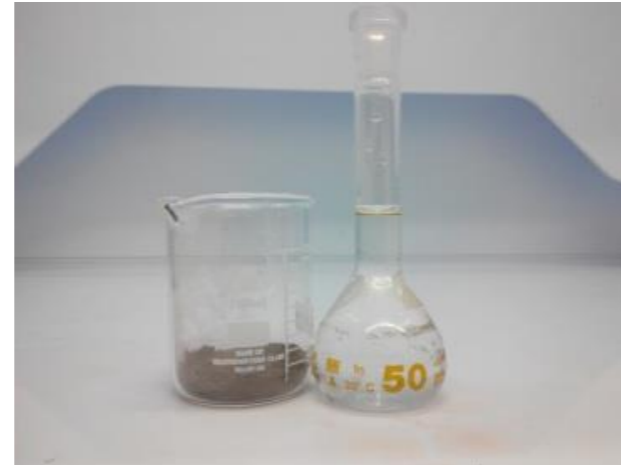


Mine neutralize method

Calibrate the pH meter



10g of mine in 50ml of H₂O



Added 1ml of 1% NaOH solution



Before treatment, pH 2.9



Neutralize to pH 5-10



1% w/w NaOH	PH
1ml	3.7
2ml	5.1
3ml	6.3
4ml	7.2
5ml	8.3
6ml	9.5
7ml	10.4
8ml	11.4