

ISEC2017

The 21st International Solvent Extraction Conference

November 5 - November 9, 2017
Seagaia Convention Center, Miyazaki, Japan

Более 350 участников

29 стран в т.ч. Чили, ЮАР, Иран, Канада, страны
ЕЭС, Россия, Индия, Китай, Корея, Япония

4 параллельно работающие секции

Более 100 докладов в области экстракции РЗЭ,
переработки ОЯТ, извлечения ДМ,
гидрометаллургии, аналитики, новых
экстрагентов и растворителей,
сверхкритической экстракции и др.



Компании участники конференции



ZEON Corporation



**SOPAT Measure
Particles Inline**



CEM EDGE



is the world's largest primary producer of platinum, accounting for about 38% of the world's annual supply.

Экстракционные технологии аффинажа МПГ

Группа компаний



Разработка химико-технологических процессов в области переработки различных видов сырья; изготовление оборудования (экстракционного, сорбционного, емкостного, фильтровального, вентиляционного, лабораторного, гальванического, оборудования по газоочистке и др.)

ТриАрк Майнинг – СП ICT Group и компании «РТ-Глобальные ресурсы» Госкорпорации «Ростех», добыча и переработка РЗМ и ниобия, производство высокотехнологичных материалов на основе РЗМ.



Стендовые доклады

EFFECTIVE SEPARATION OF Pt(IV), Pd(II) AND Rh(III) IN ACIDIC SOLUTION BY USING PHOSPHONIUM IONIC LIQUID

Mochamad Lutfi Firmansyah¹, Fukiko Kubota¹, Masahiro Goto^{1,2*}

¹Department of Applied Chemistry, Graduate School of Engineering, Kyushu University
²Center for Future Chemistry, Kyushu University

ABSTRACT

1. INTRODUCTION

Precious Group Metals

Application

- Fuel Cell
- Automobile catalyst
- Electronic device

PGMs Consumption

150 T/year

Automobile 40%

Jewelry 37%

Electronic 23%

Other 0%

PGMs production limitation

- Present in low quantity
- Difficult to collect
- Unstable supply
- Huge gap between supply and demand

Alternatives PGMs Source

Waste Recycling

Automobile waste 40%

Jewelry waste 36%

Electronic waste 24%

Other 0%

Continuous increase over the next several years

These wastes are useful secondary resource for PGMs

2. EXPERIMENTAL

Development of effective extraction systems for PGMs using phosphonium ionic liquid

Using novel phosphonium ionic liquid, tricothyldecyl phosphonium chloride for PGMs extraction

3. RESULTS AND DISCUSSION

3.1. Extraction efficiency

$E\% = \frac{C_{org} - C_{org,0}}{C_{org,0} + C_{aq,0}} \times 100$ (1)

$E\% = \frac{C_{org} - C_{org,0}}{C_{org,0} + C_{aq,0}} \times 100$ (2)

3.2. Selectivity

Hydrophobic ionic liquid

Water

3.3. Structure design

Structure design

Anion-cation pairing

Novelty Designed and Synthesized

Commercially Available

Tricothyldecylphosphonium chloride

Tributyl(tetradecyl)phosphonium chloride

3.4. Extraction selectivity in HCl solution

Extraction from mixed solution

Changes in extraction ratio with time

Loading test of Pd(II)

Synthesis of methacrylate-Styrene Copolymer Containing a Sulfur Atom and Extraction Equilibrium of Gold(III) from Hydrochloric Acid

Minako Iwakura¹, Takafumi Hanada¹, and Yoshinari Baba²

¹Chemical Science and Technology, National Institute of Technology, Miyazaki College, Miyazaki, Japan
²Department of Applied Chemistry, University of Miyazaki, Japan

Introduction

Consumption of Rare metals in Japan

70% OF THE WORLD!

Wastes of Au 150t/yr

Urban mine (containing rare metals)

Potential resources

Recovery

method

selective recovery

large extraction capacity

easy back-extraction

organic phase

aqueous phase

selective recovery!

in this study, the novel polymer type is chloroacrylate-*o*-(3-thiomethylpropyl) (ATPS) was synthesized and the extract metals were investigated. ATPS is unique selective recovery of rare metals. ATPS functional groups in its polymer skeletons group 3-mercaptopyridine contains S as selective extraction for rare metals. In addition, it is considered that the gold metal complexes and make it more

Synthesis

Functional group (S and N atoms)

Polymer skeleton

DMF, K₂CO₃

120rpm

Reflux

Reactor and synthesis step

MP: 4g / DMF

ACM-CMS 5g

K₂CO₃ 12g

DMF 200ml

24h, 333K

DW, Chloroform

Separation

Evaporation

0.1M-HCl

0.1M-NaOH

polymer gel

Yield: 66%

Physical properties

Molecular weight

5.4 × 10³ [g/mol] / Chloroform

16.1 [mM/ml]

Quantitative of Nitrogen atom

Absorption amount of N

0.25wt%-ATPS /chloroform

HCl solution

shaking, 24h, 303K

Titration by NaOH

Pyridine group: 2.082 [mmol/g]

Extraction selectivity in HCl solution

Extraction from mixed solution

Cu: 0.1 → 250mM, 1.1M HCl

selective extraction was possible in higher [Cu] level

Extraction equilibrium in 1h

Selective extraction of antimony and arsenic with alkylated piperazine

(Miyazaki University) Shintaro Kanemaru¹, Rieko Miura, Tatsuya Oshima, Yoshinari Baba

1. Introduction

antimony

Antimony is superior in incombustibility and wear resistance.

- Flame retardant auxiliary
- Lead battery

Resources are maldistributed in the specific countries, and Japan depends on the import

e-waste recycling rate is almost 0%

environmental pollution problems

Development of the selective extractant is important.

What is a solvent extraction?

Solvent extraction is a selective separation method for isolating and concentrating an objective material from aqueous solutions with an organic solution containing extractant.

2. Experimental

2.1. Synthesis

2.2. Extraction

2.3. Stripping

3. Results and discussion

3.1. Metal extraction selectivity

TEHA

DDCMP

log[HCl]_{aq}

Fig. 1 Effect of concentration of hydrochloric acid on the extraction percentage of metal ions with TEHA and DDCMP.

3.2. Stripping of metals extracted

PGM Extraction Properties of Calix[4]arene-Based n-Dialkylamino Extractants from Leach Liquors of Automotive Catalysts

Manabu Yamada¹, Yu Kaneta², Muniyappan Rajiv Gandhi², Yoshihiko Kondo², Uichi Akiba², Kenshu Fujiwara²

¹Research Center for Engineering Science, Graduate School of Engineering Science, Akita University
²Department of Life Science, Graduate School of Engineering Science, Akita University

Introduction

Solvent Extraction

Organic phase

Aqueous phase

Extraction

Stripping

Developed Calixarene Extractants

SMe

This time Developed Extractants

By introducing hydrophobic and long alkyl chains

Extractants may show solubility in hydrocarbon-based diluents such as toluene

Experimental

Synthesis of Calixarene-based Extractants

HCHO, R₂NH, AcOH

THF, r.t.

Extraction Procedure

Shaking 300 rpm

Centrifugation 3500 rpm

The aqueous phase were measured by ICP-AES

Extraction percentage (E%) were calculated by using equations (1) and (2).

$E\% = \frac{[M]_{org}}{[M]_{org} + [M]_{aq}} \times 100$ (1)

$[M]_{org} = \frac{[M]_{aq}}{D}$ (2)

Result

Solubility of extractants for diluents

Table 1 Investigation of solubility of 1 - 8 in diluents

Diluents	Boiling point (°C)	Dielectric constant	Solubility in diluents								
			1	2	3	4	5	6	7	8	
CHCl ₃	61.0	4.81	N.S.	G.S.	G.S.	G.S.	G.S.	G.S.	G.S.	G.S.	G.S.
1,2-Dichloroethane	83.5	10.38	—	G.S.	G.S.	G.S.	G.S.	G.S.	G.S.	G.S.	G.S.
o-Dichlorobenzene	180.3	9.93	—	G.S.	G.S.	G.S.	G.S.	G.S.	G.S.	G.S.	G.S.
Chlorobenzene	131.0	9.62	—	N.S.	G.S.	G.S.	G.S.	G.S.	G.S.	G.S.	G.S.
Toluene	110.0	2.38	—	N.S.	N.S.	G.S.	G.S.	G.S.	G.S.	G.S.	G.S.
Xylene	138.4	2.20	—	N.S.	N.S.	N.S.	N.S.	N.S.	G.S.	G.S.	G.S.
Kerosene	150-300	1.80	—	N.S.	N.S.	N.S.	N.S.	N.S.	G.S.	G.S.	G.S.
Shellcil D70 [®]	193-245	2.10	—	N.S.	N.S.	N.S.	N.S.	N.S.	G.S.	G.S.	G.S.

Выставка оборудования

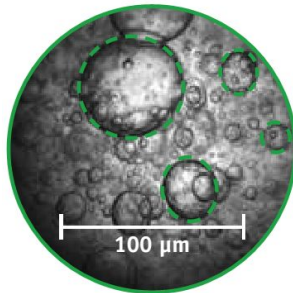


Try and Buy: Avoid missing out on a financial advantage, and purchase the SOPAT particle measurement system after a successful rental period.

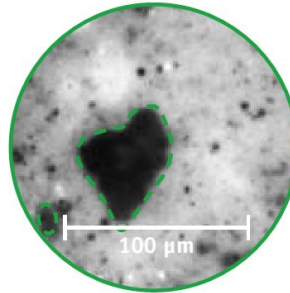
Прибор для наблюдения за технологическими процессами в реакторе



Опытная установка экстракции,
цена - 498 000 ¥



Bubbles and Droplets



Suspensions, Powders, and Crystals



Chemical Industries



Oil & Gas



R & D



Food Industries



Agriculture



Pharma/Biochemistry

Приглашение на конференцию ISEC-2020

ISEC 2020

in Sweden





GOTHENBURG

Sweden



BETWEEN MEETINGS

Gastronomic brilliance
This gourmet's dream offers innovative cuisine using local produce. Specialty fish and shellfish is our claim to fame. Cuisine from all over the world is offered at reasonable prices at first-class, gourmet, trendy or traditional restaurants. Sjörenskaagiet are awarded with a Guide Michelin star.

Attractions
Gothenburg and West Sweden offers an exceptional combination of city life, culture and nature. Historical and contemporary attractions and activities are miles with a wide repertoire of entertaining shows, sports, cultural events, shopping, fairs and exhibitions.

A number of prominent cultural institutions are found in five minutes walking distance. View the unique collection of Nordic art at the Museum of Art or enjoy Gothenburg Symphony Orchestra at the Concert Hall.

Relax
In less than half an hour you'll be on a boat taking you to the picturesque islands of the archipelago. The many islands stretch along the coast like a string of pearls. The many tree-covered parks, as well as forests and lakes are only a stone's throw away.

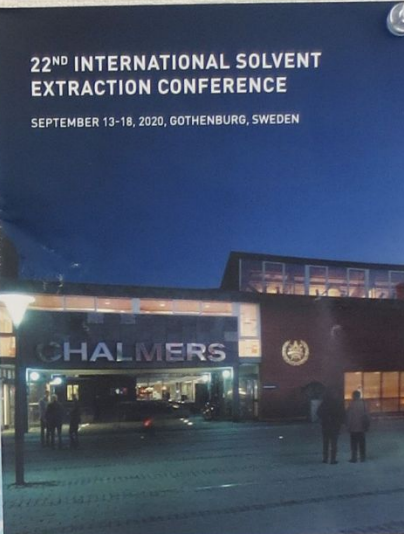
GETTING HERE IS EASY

- International airport less than 20 minutes from the city centre.
- 80 direct flights from more than 60 destinations.
- Ferry from Kiel and Friedrichshafen.



22ND INTERNATIONAL SOLVENT EXTRACTION CONFERENCE

SEPTEMBER 13-18, 2020, GOTHENBURG, SWEDEN



CHALMERS

gothenburg

SAVE THE DATE

COPPER INTERNATIONAL CONFERENCE
AUGUST 18-21, 2019 | VANCOUVER, BC, CANADA

Metsoc, the 58th annual Conference of Metallurgists (COM 2019) and CIM are honoured to host Copper 2019, marking a milestone in the International Copper Conference Series with the 10th Edition.


Featuring:

- Mining & Geology
- Mineral Processing
- Electrowinning & Electrorefining
- Pyrometallurgy
- Hydrometallurgy
- Process Control
- Sustainable Development, Health & Safety, and Environment
- And more!


Conference Chair: COM 2019 Chair: Dr. Edward Asselin, University of British Columbia
Copper Chair: Dr. Jari Kapusta, SBA Inc.

Plan to join us for the largest international copper event in Vancouver in 2020.

metsoc.org



Cu IN VANCOUVER IN 2019



August 18-21, 2019
Vancouver, BC, Canada

COPPER 2019 COPPER INTERNATIONAL CONFERENCE | 10th Edition

Hosted by: COM 2019

metsoc.org