

# High Speed CounterCurrent Chromatography



KUTUWA Sangyo Co., Ltd.

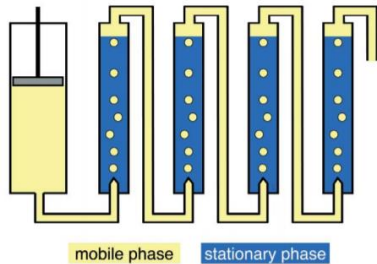
# Introduction

KUTUWA Sangyo Co., Ltd. is a professional manufacturer of HSCCC (High Speed counter current chromatography) instruments. We possess the patented HSCCC techniques and have manufactured a series of HSCCC equipments all by ourselves, which named Easy-PREPccc H.



# Background

HSCCC is the most advanced technology in the liquid-liquid chromatography.



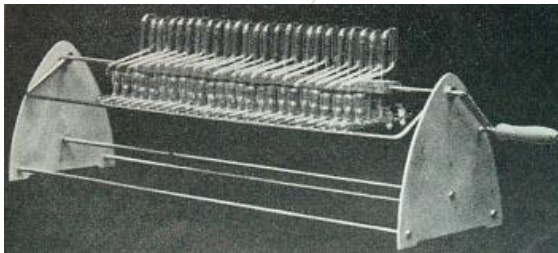
Droplet CounterCurrent Chromatography (DCCC)

参考URL: <https://gfp.people.uic.edu/countercurrent/content/history.htm>



High Speed CounterCurrent Chromatography (HSCCC)

1950



Craig apparatus

1980

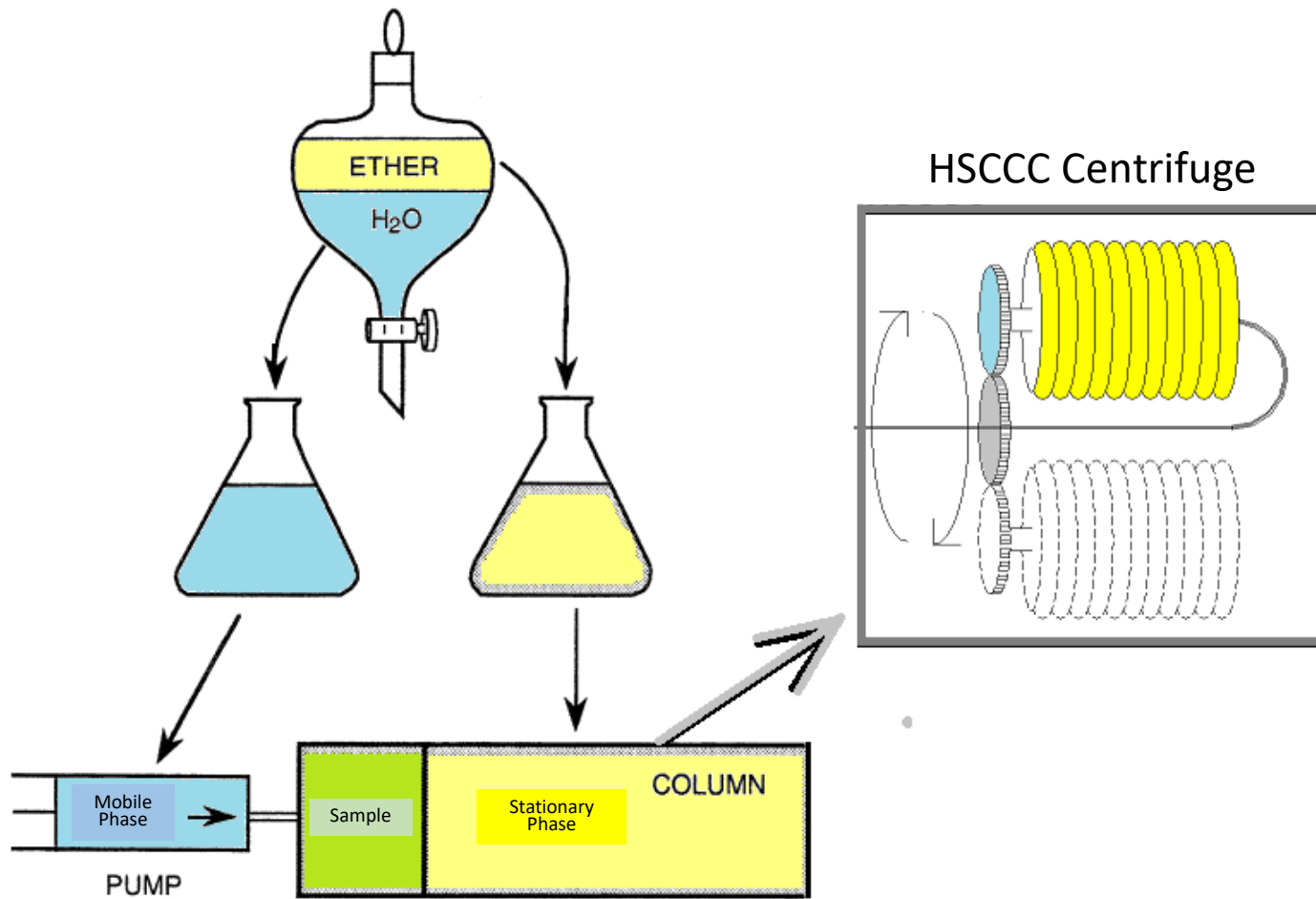


Centrifugal Partition Chromatography (CPC)

参考URL: <http://www.ssc-jp.com/products/29-35.html>

1990

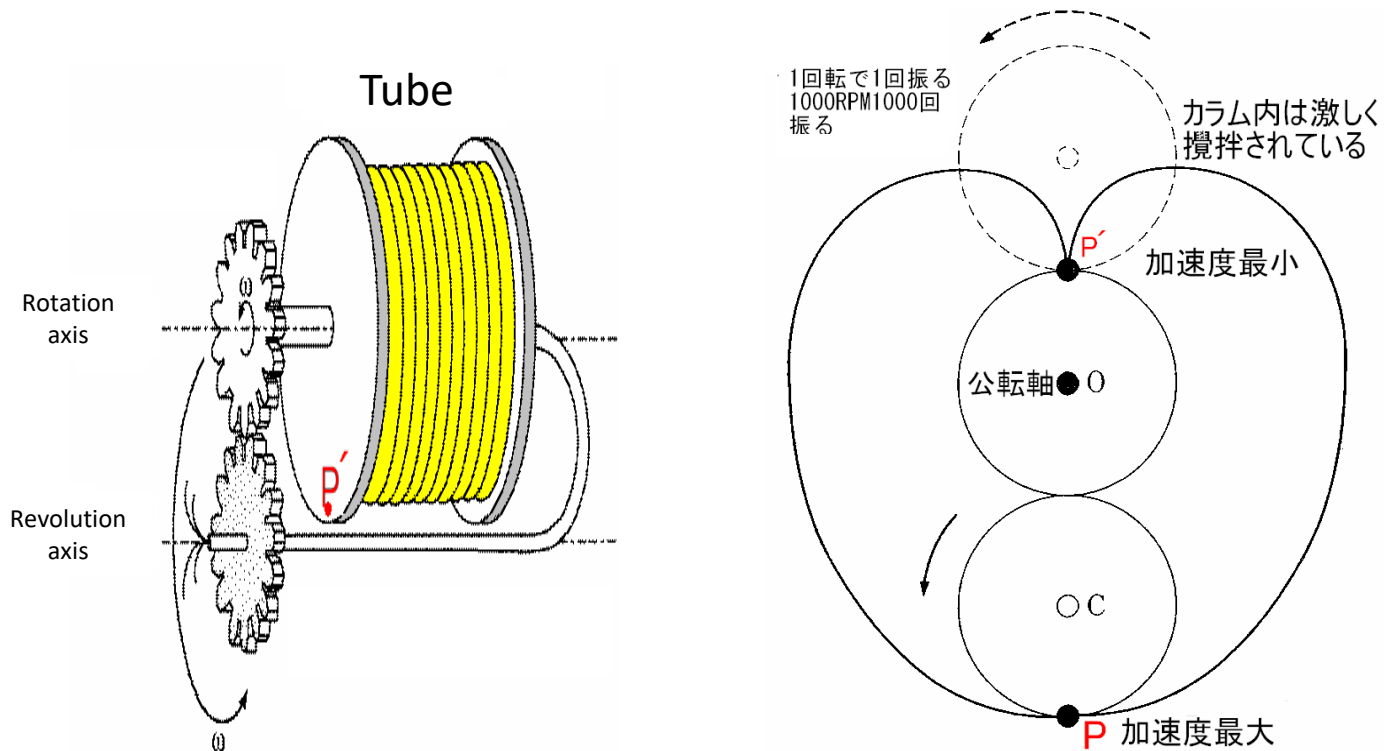
# Principle of HSCCC



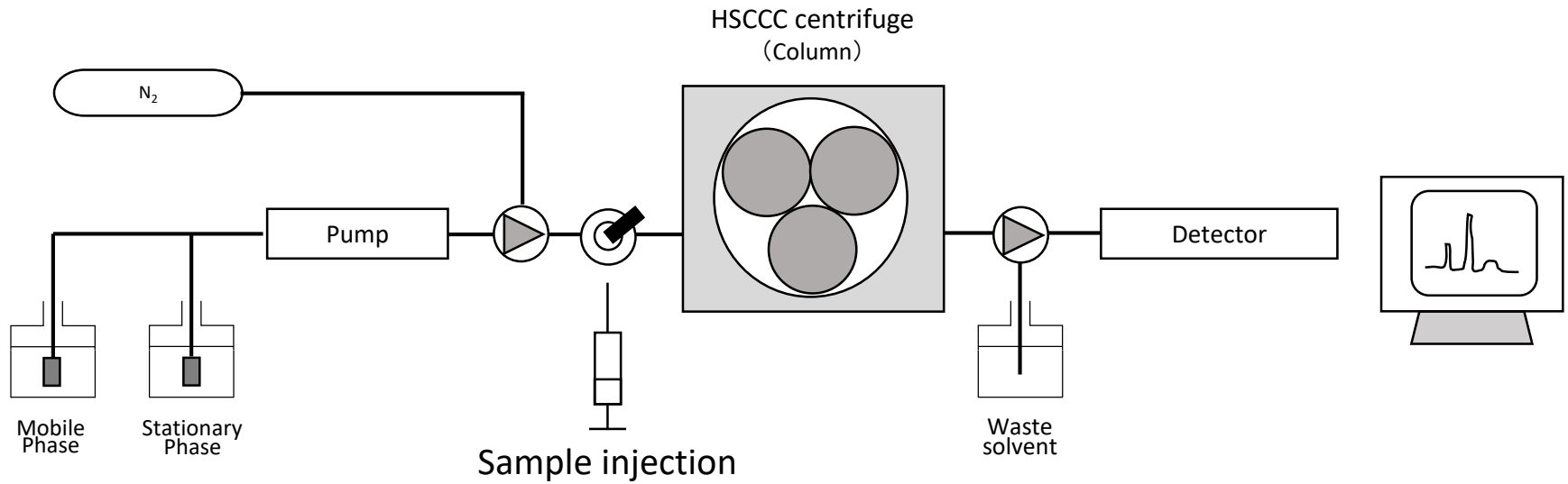
# Principle of HSCCC

The two-dimensional centrifugal force field caused by the simultaneous rotation and revolution hold one liquid phase as stationary phase in the separation tube.

HSCCC actualized high frequency extraction between two phases by high speed planetary centrifuge. Different components in the sample will be eluted due to their respective distribution coefficient.



# HSCCC Working Flow Chart



# Features of HSCCC

- High Performance
- 100% Sample Recovery
- Scalable
- Cost-efficient
- Versatile Selectivity
- Safe Operation

# In comparison to HPLC

- Larger Preparation Capacity
- No Consumables & Low in Operation Cost
- No Irreversible Adsorption & Simplified Sample Pre-Preparation

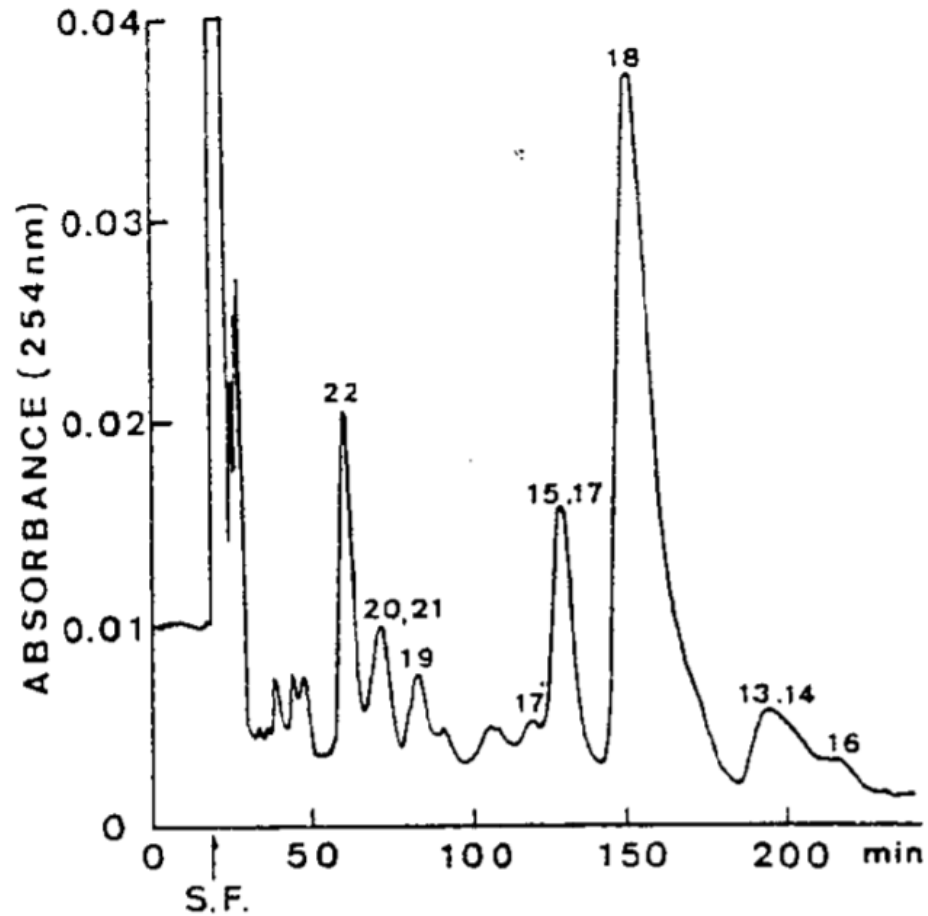


# Application Field

HSCCC has been applied to different researches such as biochemistry, pharmacy, agriculture, environmental science, material research, chemistry, biology and inorganic ion. It is an extremely effective technique for the separation of natural products, antibiotics, proteins and noble metals.

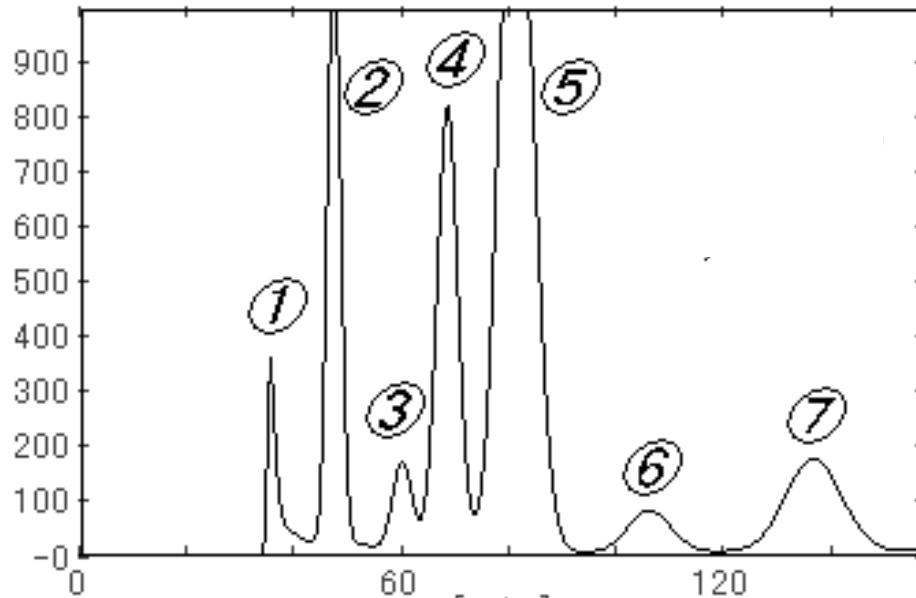
- (1) Separation of APIs from natural products
- (2) Separation of large biological molecules such as proteins, polypeptides and polysaccharides.
- (3) Separation of antibiotics
- (4) Separation of rare earth elements and noble metal elements
- (5) Purification of chemical synthetic products
- (6) Separation of functional food component
- (7) Separation and analysis of pesticide residues
- (8) Quality control research of herbals
- (9) Separation of active marine ingredients

# Sample



Sample: Bacitracin Components(50mg)  
Solvent: Chloroform/ethanol/water(5:4:3)  
(lower phase as mobile phase, 3 ml/min)  
Detection: 254nm

# Sample



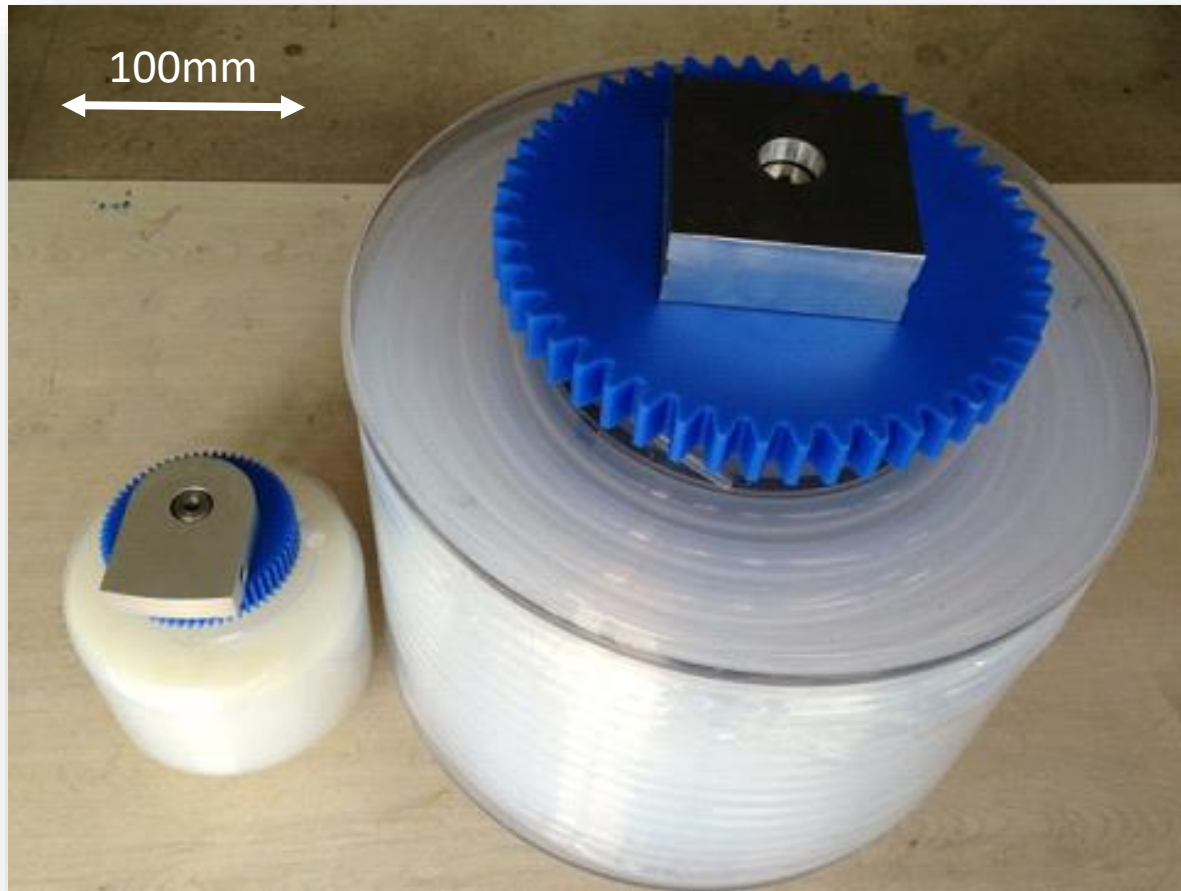
Sample: Polyphenols (100mg)  
Solvent: ethylacetate/formic acid(2%)/water  
(lower phase as mobile phase, 4 ml/min)  
Detection: 325nm

# Separation Production

Antibiotics	Altetoxin I , Cyclosporine A, Cyclosporine B, Cyclosporine C, Cyclosporine D, Cytochalasin N, Erythromycin A, Erythromycin B, Erythromycin C, Isovaleryl spiramycin III
Proteins	$\alpha$ -Amylase, Cytochrome C, Hemoglobin, Lysozyme, Ovalbumin, Ovotransferrin, rhClFN- $\alpha$
Phenylpropanoids	Angelica coumarin, Artemisiae capillaris scoparone, Cnidii coumarin, Cortex fraxini coumarin, Costus alctone, Curdinone, Daphnoretin, Dehydro costus alctone, Deoxyschizandrin, Edgeworoside C, Germacrone, Pinoresinol diglucoside, Isopsoralen, Liriodendrin, Honokiol, Magnolol, Peucedanum decursivum coumarin, Peucedanum praeruptorum dunn coumarin, Psoralen, $\gamma$ -Schizadrin, Syringin, Thyme coumarin, Umbelliferone
Flavonoids	Baicalein, Baicalin, Chrysin, Daidzin, Daidzein, Didymin, Genistin, Glycitein, Glycitin, Hyperoside, Isoliquirtigenin, Isorhamneitin, Isovitexin, Isoorientin, Kaempferol, Kuyayinone, Liquiritigenin, Nairutin, Quercetin, Scutellarin, Trollius ledebouri flabonoid glycosides, Wogonoside
Terpenoids	Atractyloside, Atractylenolide III, Bilobalide, Gentiopicrin, Ginkgolide A, Ginkgolide B, Ginkgolide C, Ginkgolide J, Harpagoside, Jasminoidin, Paclitaxel, Ursolic acid
Quinones	Cryptotanshinone, Tanshinone I , Tanshinone II A
Steroids	Androstenedinone, $\beta$ -Ecdysterone, Sitosterol, Spinasterol
Alkaloids	Berberine, Camptothecin, Coptisine, Evodiamine, Heteratisine, Huperzine A, Huperzine B, Matrine, 15-a-Neoline, 1-Tetrahydropalmatine, Oxymatrine, Oxysophocarpine, Rutacarpine, Palmatine, Verticine, Verticinone
Isomerides	Barbinervic Acid stereisomer, Gambogic acid stereisomer
Saponins	Astragaloside, Clinopodiside A, Ginsenoside-Re, Ginsenoside-Rg 1, Glycyrrhizic acid
Organic acid, acid anhydride, and esters	Cinnamic acid, 3,4—Dihydroxyphenyllactic acid, Eicosanoic acid, Ferulic acid, Gallic acid, Ginkgolic acid(C13:0), Ginkgolic acid(C15:1), Ginkgolic acid(C17:0)
Polyphenols	EGCG, Salvianolic acid B, Theaflavin
Other substances	Amygdalin, Aurentiamide acetate, Chebulagic acid, Chebulinic acid, Curculigoside, Curculigoside B, 10-Hydroxynonacosane Z-Ligustilide, Linderalactone, Pseudostellarin, Senkyunolide A

# Technology Scale UP

The large type HSCCC can load the sample in 10-30g



Preparative column

Large type column

# Contact

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