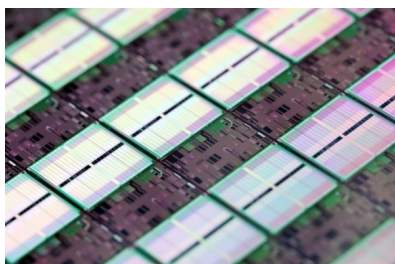# Accurate composition analysis by micro-RBS

New RBS instrument is introduced into Toray research center, Inc., equipped with the world's first focused-high-energy-ion-beam line. The accurate composition analysis on a micron order is now realized, using this new instrument.
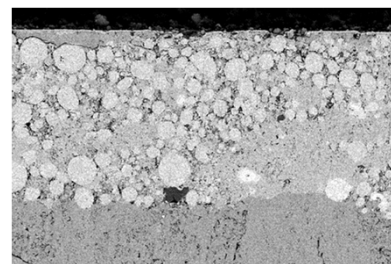
1. Composition analysis on a micron order

Applications of micron-scale composition analysis

device　　　*Single particle*　　　*Cross section*

|	Micro-RBS	SEM-EDX	EPMA
Spatial resolution	>2 µm	>10 nm	>100 nm
Element	H, Li～U	B～U	B～U
Accuracy	◎	△	○

Features of micro-RBS
- **Quite accurate composition**
- All elements quantification, including H
- High sensitivity for light elements (NRA)
- Density for thin film
- **The only instrument in the world's commercial analytical companies**

2. µRBS (microbeam Rutherford Backscattering Spectrometry) analysis

YAG particles for LED devices

◆ SEM image

（Cross section of LED device）

µRBS analysis
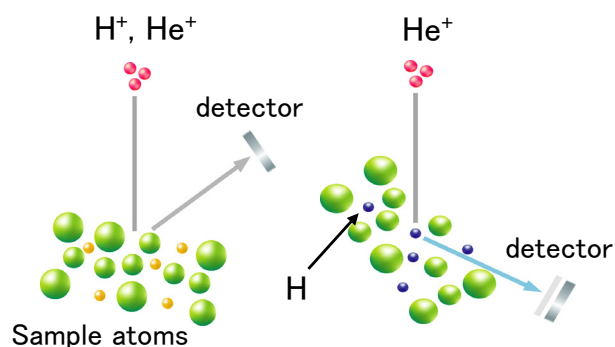(2 µm sq.)

20 µm

Single particle analysis from cross section
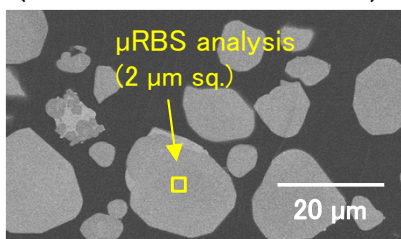
◆ µRBS analysis

Element	Atomic (%)
Y	15.8
Al	24.0
O	59.9
Ce	0.3_3

◆ Principle

H^+, He^+　　　He^+

detector

H

detector

Sample atoms

RBS : Rutherford Backscattering Spectrometry
　　　　(Detect backscattered incident ions)
HFS : Hydrogen Forward Scattering Spectrometry
　　　　(Detect recoiled H)
NRA : Nuclear Reaction Analysis
　　　　(Detect radiation from nuclear reaction)

We can obtain accurate compositions of materials with micron-scale spatial resolution, using micro-RBS !

Toray Research Center, Inc.