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 Recycling Preparative HPLC  
LaboACE LC-5060

## Recycling by SEC Column Purification of Black Dye

**Keyword:**

 Purification of DSSC (Dye Sensitized Solar Cell) Material,  
SEC Column, Size Exclusion Chromatography

### Introduction

In preparative HPLC, the column length is one of the key factors to get better separation. However, there is a limit in length due to restriction on the pressure the column can endure.

Recycling preparative HPLC is the solution to the problem. By cycling the sample solution back to the same column repeatedly, it causes the same effect as a longer column is used. Further, no solvent is consumed during the cycles. So it is the ideal way to efficiently increase separation (resolution) ability.

Also, combined use of SEC column, which separates compounds by their size, has gained great popularity among synthetic organic chemists since it can considerably save labor and time for method development as long as the sample is dissolved in some solvent.

Here is an example of recycling preparative HPLC using aqueous SEC column.

### Experiment & Results

Sample: BD (Black Dye) available on the market, a common material used for dye sensitized solar cell. We tried to remove impurities by Recycling Preparative HPLC using SEC column.

Instrument : LC-9110NEXT (Detector : UV (254 nm))

Column : JAIGEL-W252

 Mobile phase : Water (TBA-OH, pH9.8) / 100 mM NaClO<sub>4</sub> in Methanol (20/80)

Flow rate : 4 mL/min

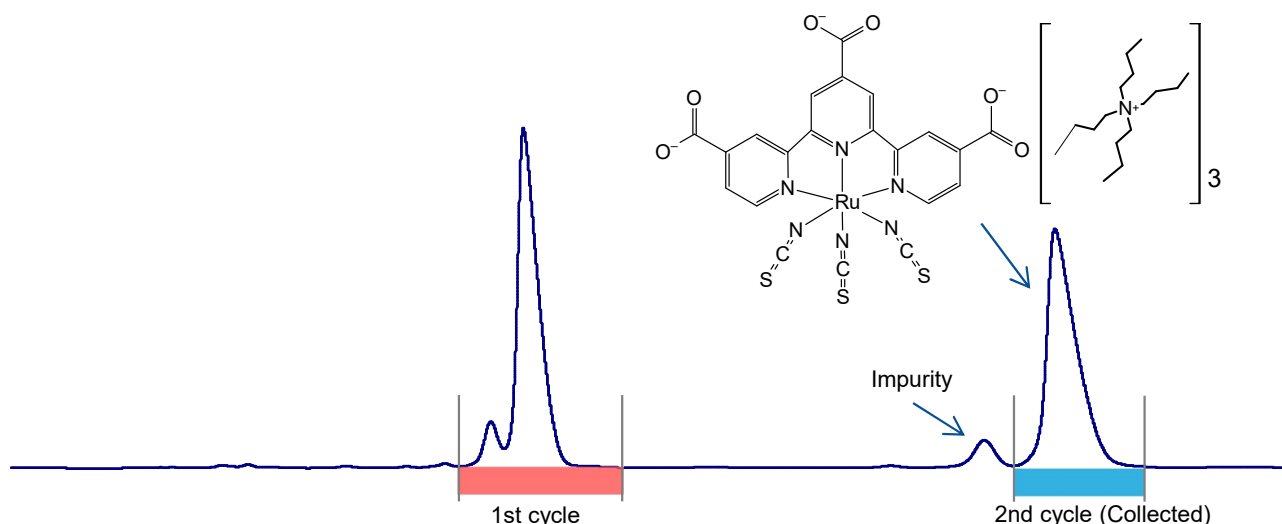
■ : Recycled area  
■ : Collected area


Fig. 1

### Conclusion

We were able to isolate the impurity and purify BD at the 2nd cycle.