

Greener Normal Phase SepaFlash® HP Fusion Column, Half the Separation Time, Half the Elution Solvent Consumption

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Chromatography Application Note ANSS-013



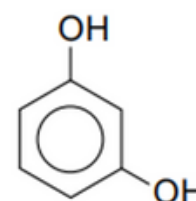
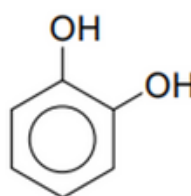
The importance of saving organic solvents is multifaceted, encompassing environmental, economic, and safety considerations. From an environmental perspective, organic solvents are often volatile and can contribute to air pollution, as well as contaminate soil and water when not properly disposed of. Economically, organic solvents can be expensive and represent a significant cost in chemical synthesis and separation processes.

One way to save solvent in flash chromatography for the purification of chemical compounds is to use a more efficient packing material in the chromatography column. Smaller particle sizes in the stationary phase can increase the interactions between the stationary phase and the substrates, allowing for faster separation and less solvent consumption.



Santai has developed SepaFlash® Fusion columns (SW-5102) featuring silica gel with smaller particle size, which offer enhanced separation capacity for users of flash chromatography. These columns can help save solvent and shorten purification times.

The separation of structural isomers is known to be difficult. Therefore, we have chosen a pair of structural isomers catechol (A, benzene-1,2-diol) and resorcinol (B, benzene-1,3-diol) as the target compounds for purification. This choice allows us to demonstrate the solvent saving effect of our HP Fusion column (SW-5102).



The separation of A and B by standard silica column (S-5101-040, 40-63 μm , 60 \AA) requires 18 minutes, with an elution solvent consumption of 720 ml (40 ml/min * 18 mins). With our SepaFlash Fusion columns (SW-5102-040, 25-40 μm , 60 \AA), the same baseline separation can be accomplished in 9 minutes, using only half the elution solvent, which amounts to 360 ml (40 ml/min * 9 mins).

Comparing this to the standard series silica gel column S-5101-040 (irregular, 40-63 μm , 60 \AA), the use of HP Fusion series filled with small particle size silica gel column SW-5102-040 can reduce the running time by half and the elution solvent usage by half.

Instrument	SepaBean™ machine 2	
Columns	40 g SepaFlash® Standard column (irregular, 40-63 μm , 60 \AA , S-5101-040)	40 g SepaFlash® HP Fusion column (irregular, 25 - 40 μm , 60 \AA , SW-5102-040-IR)
Wavelength	275 nm 280 nm	
Mobile phase	Solvent A: Hexane Solvent B: Ethyl acetate	
Flow rate	40 mL/min	
Sample loading	150 mg	

Table 1. The experimental setup for flash purification of A and B by two different columns.

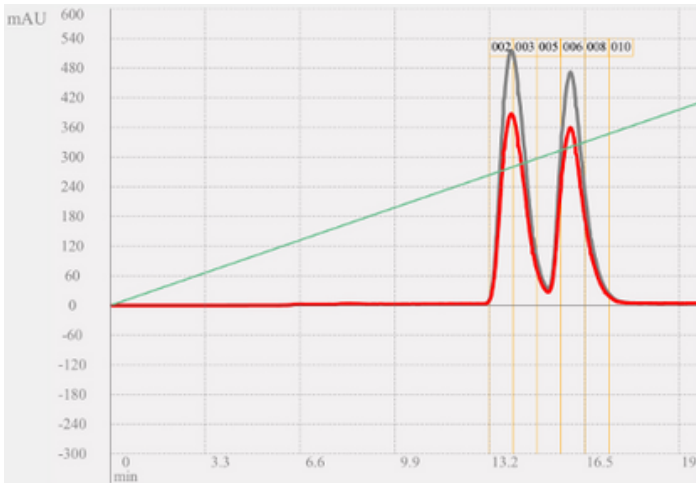


Figure 1. The flash chromatogram of A and B by Standard silica column (S-5101, 40-63 μm , 60 \AA)

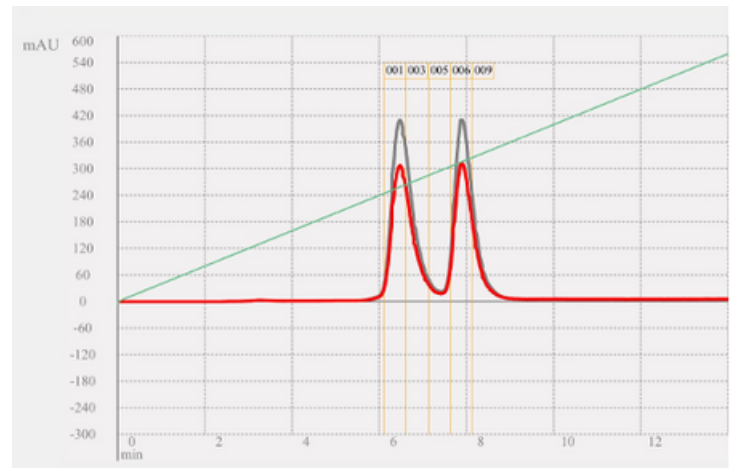


Figure 2. The flash chromatogram of A and B by HP Fusion Silica column (SW-5102, 25-40 μm , 60 \AA)

As shown in Figure 1 and Figure 2, using the HP series small particle sizes silica gel column SW-5102-040 not only saves solvent and time but also results in sharper chromatographic. In the SepaBean™ machine 2 system, fractions are collected in fewer test tubes, further reducing the use of test tubes and post-experiment processing time. By choosing this type of separation column, laboratories can save 50% on elution solvent and achieve an overall cost reduction of 30% to 40%. Take a step towards greener operations by choosing Santai Fusion column.

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