CombiFlash® EZ Prep Phase Change

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Chromatography Technical Note TN26

Overview

The Combi*Flash* EZ Prep is a combination flash and preparative HPLC system in a single unit. The pumping system allows any solvent to be chosen at any time during the purification. The Combi*Flash* EZ Prep can be configured to run in normal phase for flash chromatography and reverse phase for preparative HPLC operations. This technical note describes how to change the solvents in a variety of situations. During any phase change the miscibility between solvents must be considered.

There are two options available to assist in switching solvents on the Combi*Flash* EZ Prep system.

- Automatic Phase Change
- Manual Guided Phase Change

Automatic Phase Change

In order to utilize the automatic phase change routine, some structured guidelines in setting up the solvents need to be followed. The configuration for the Combi*Flash* EZ Prep consists of lines 1 and 2 used for normal phase (NP) chromatography and lines 3 and 4 used for reversed phase (RP) purifications. The Combi*Flash* EZ Prep system default settings allow you to take advantage of the automated phase change procedure.

To activate the Automatic Phase Change feature:

1. Select TOOLS, from the drop down menu, then select CONFIGURATION.
2. On the INSTRUMENT CONFIGURATION tab, push the ENABLE AUTOMATIC PHASE CHANGE button. The system will remind you of the order that solvents must be installed (Figure 1).

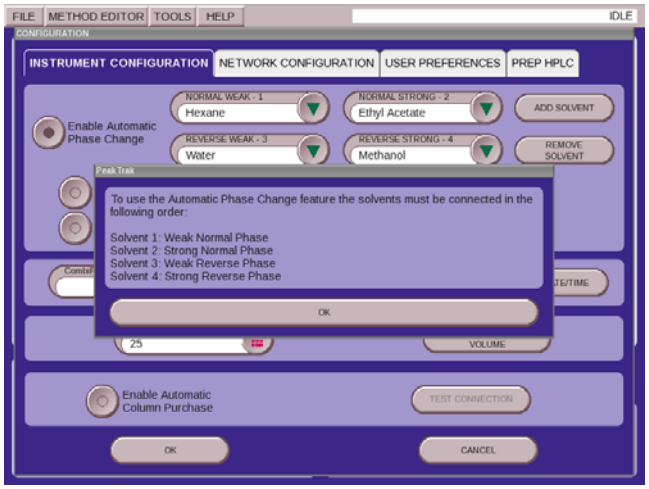

Figure 1: Reminder of the order of solvents

3. By selecting OK the screen now shows the solvent strength above the respective solvent name (Figure 2).

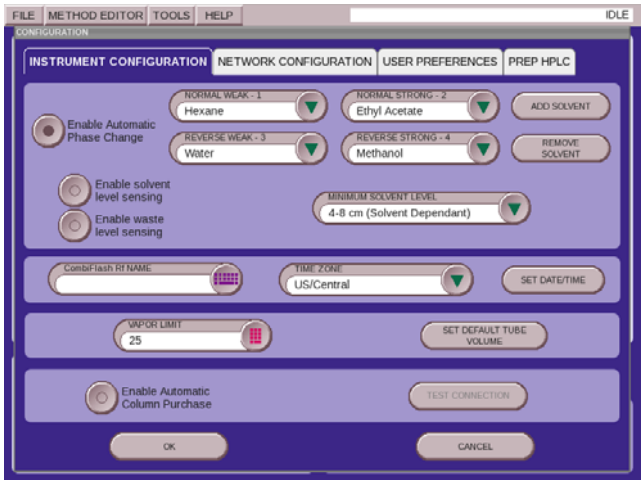

Figure 2: Solvent names and strengths

4. To deactivate the Automatic Phase Change simply press the ENABLE AUTOMATIC PHASE CHANGE button a second time. Note that the labels above the solvent name now display the solvent line numbers (Figure 3).

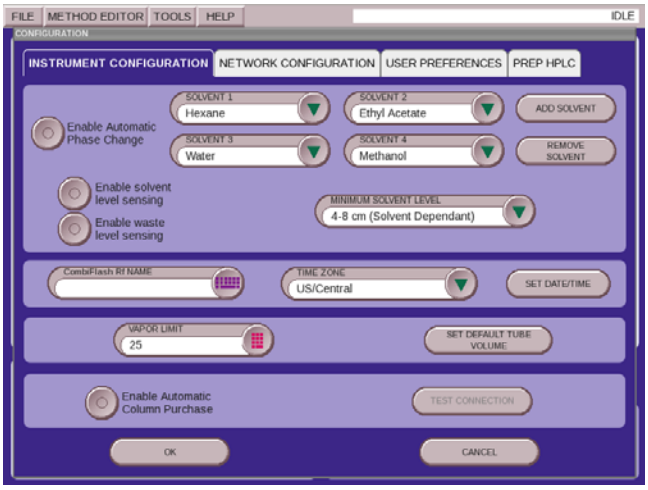

Figure 3: Solvent line numbers assigned to the solvent names

5. Activate the AUTOMATIC PHASE CHANGE button and select OK. This closes the configuration screen and saves the settings.

No further interaction is needed. The system will now automatically activate the phase change program when the system detects that the method uses a different solvent from the previous method. For example, the run just finished used a gradient from Solvent 1 to Solvent 2. The new column calls for a run from Solvent 3 to Solvent 4. When you click OK on the RUN REQUIREMENTS screen the system will automatically begin a phase change sequence. A message is displayed during this time. Once the phase change is complete, the equilibration will begin and the run will start.

Manual Guided Phase Change

The second technique is a user guided process that allows the user to select which solvents need changed and what the new solvent will be once the phase change is completed. This feature can be found on the TOOLS drop down menu by selecting MANUAL PHASE CHANGE. To use this program, simply follow the steps as outlined below:

1. On the opening screen the user is prompted to select the solvents to be changed in order of decreasing solvent strength. In the example, the solvent in Position 2, Ethyl Acetate, and the solvent in Position 1, Hexane, are going to be replaced by Methanol in Position 2 and Water in Position 1. If all four solvents are to be changed, the solvent with greater solvent strength are to be switched first.

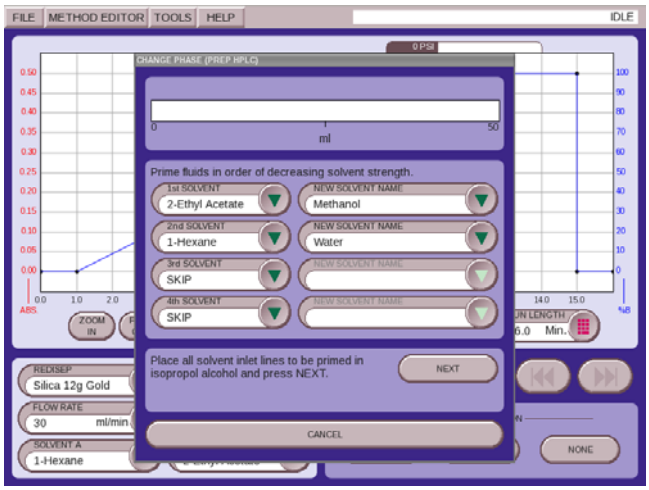

Figure 4: Position of solvents

2. The text box below the solvent selection box tells the user to place all solvent inlet lines to be primed, in the example that would be lines 1 and 2, into isopropyl alcohol (IPA) and then press NEXT.
3. The system will now automatically pump 50 mL of IPA through each of the lines chosen to have the solvent switched.

Once the lines to be changed are flushed with IPA, a new screen appears telling the user to now place all solvent lines to be changed into the new solvents and press PRIME (Figure 5).

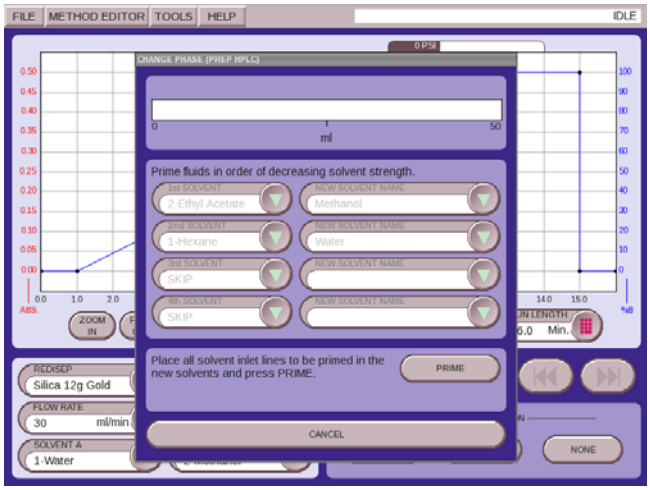

Figure 5: System is ready for new solvents

4. The system will again pump 50 mL of each of the new solvents, in the example, Methanol followed by water. Once this is finished, the solvent phase change process is complete.
5. The user is now ready to run the system, both the Prep and Flash sides using the new solvents. In the example, this is the process followed to switch from Normal to Reversed Phase operation.

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