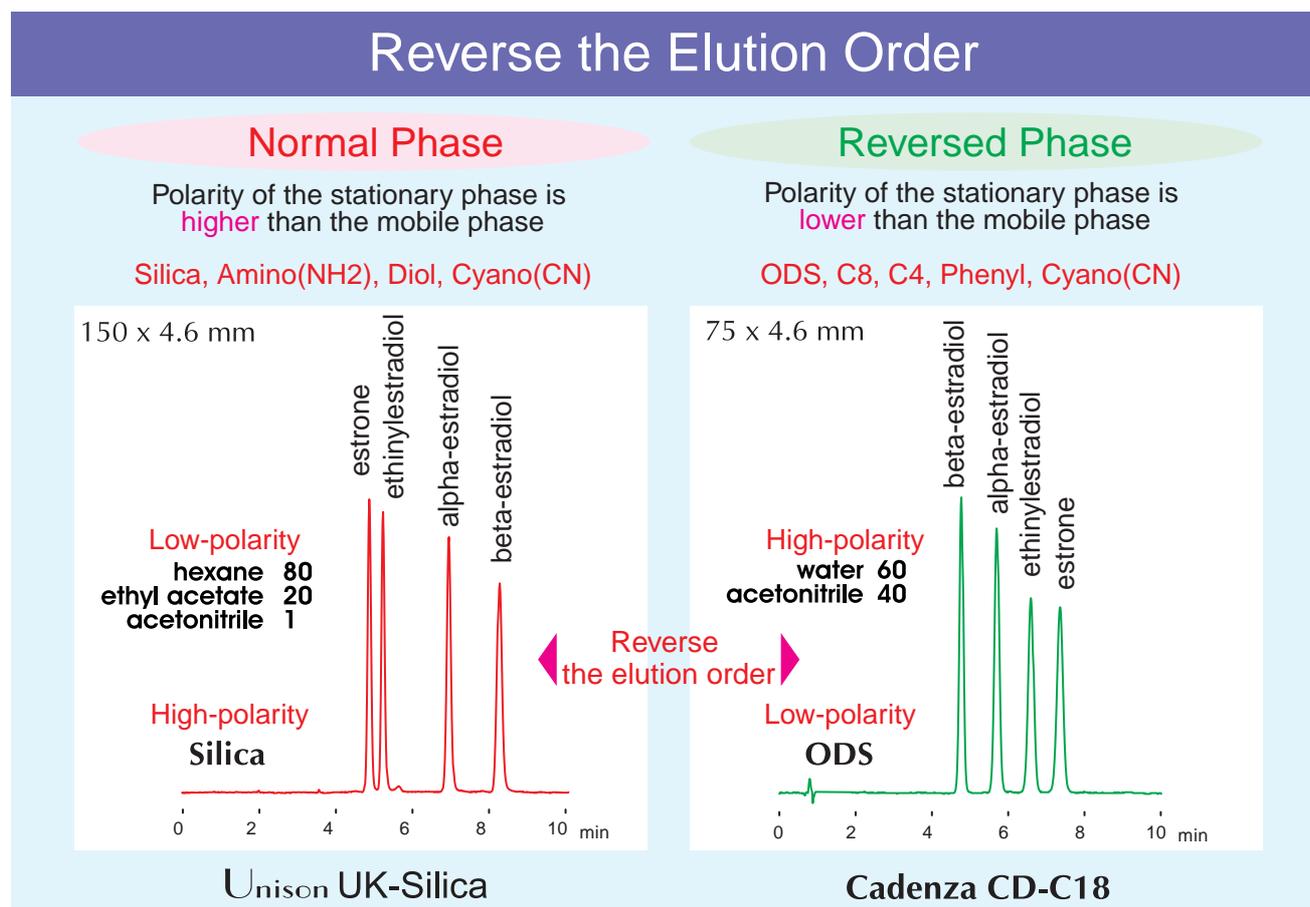


Cadenza CD-C18  
Unison UK-Silica

Technical

## Normal Phase and Reversed Phase



The partition mode of the normal and reversed phases are defined by their relative relationship to the high/low polarities within the stationary and mobile phase as follows:

- **Normal-Phase (NP)** : Polarity of the stationary phase is higher than the mobile phase (Silica, Amino)
- **Reversed-Phase (RP)** : Polarity of the stationary phase is lower than the mobile phase (ODS, etc)

The data above shows the separation of estrogens with each mode of reversed and normal phase. With silica normal phase separation, solutes elute in order from the lowest polarity. On the other hand, with the reversed phase, solutes elute in order from the highest polarity. There is a tendency for the reversed and normal phases to elute in opposite orders.

In the history of liquid chromatography, the "normal-phase" mode started with the separation of chlorophyll by Twett in 1903 using a CaCO<sub>3</sub> (highly polar) column and an ether-based mobile phase (low polarity). The "reversed-phase" mode is believed to have started around 1969 with the introduction of the ODS column.

By definition, it is only the "polarity" relationship between the stationary phase and the mobile phase that is determined. Other factors such as the structure of the stationary phase or the type of mobile phase (whether it is aqueous or non-aqueous) are not predefined. Consequently, the "HILIC" mode, which employs a water-based mobile phase along with a highly polar stationary phase, can be interpreted as an extension or variant of the conventional normal phase mode.