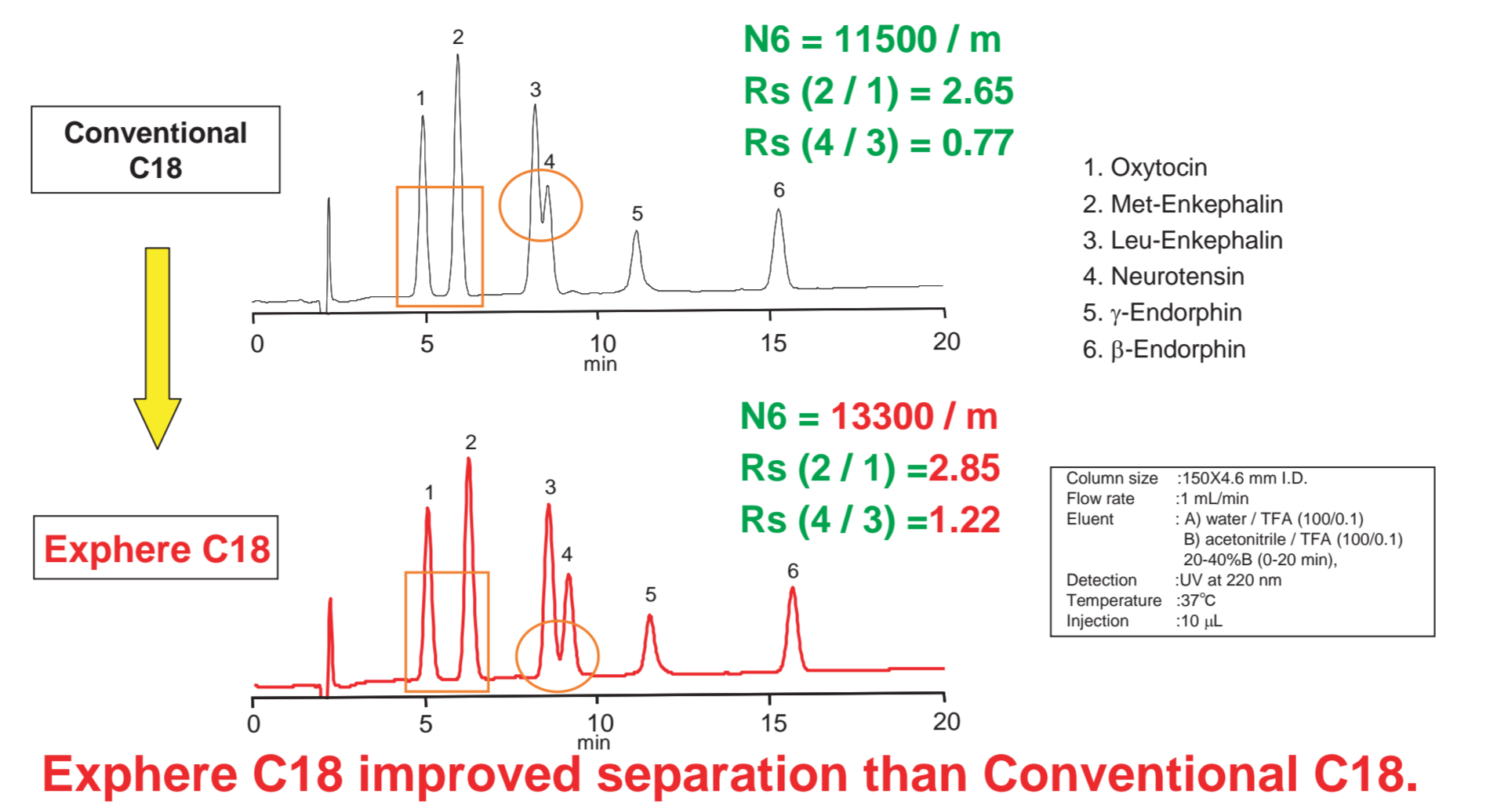


Introduction

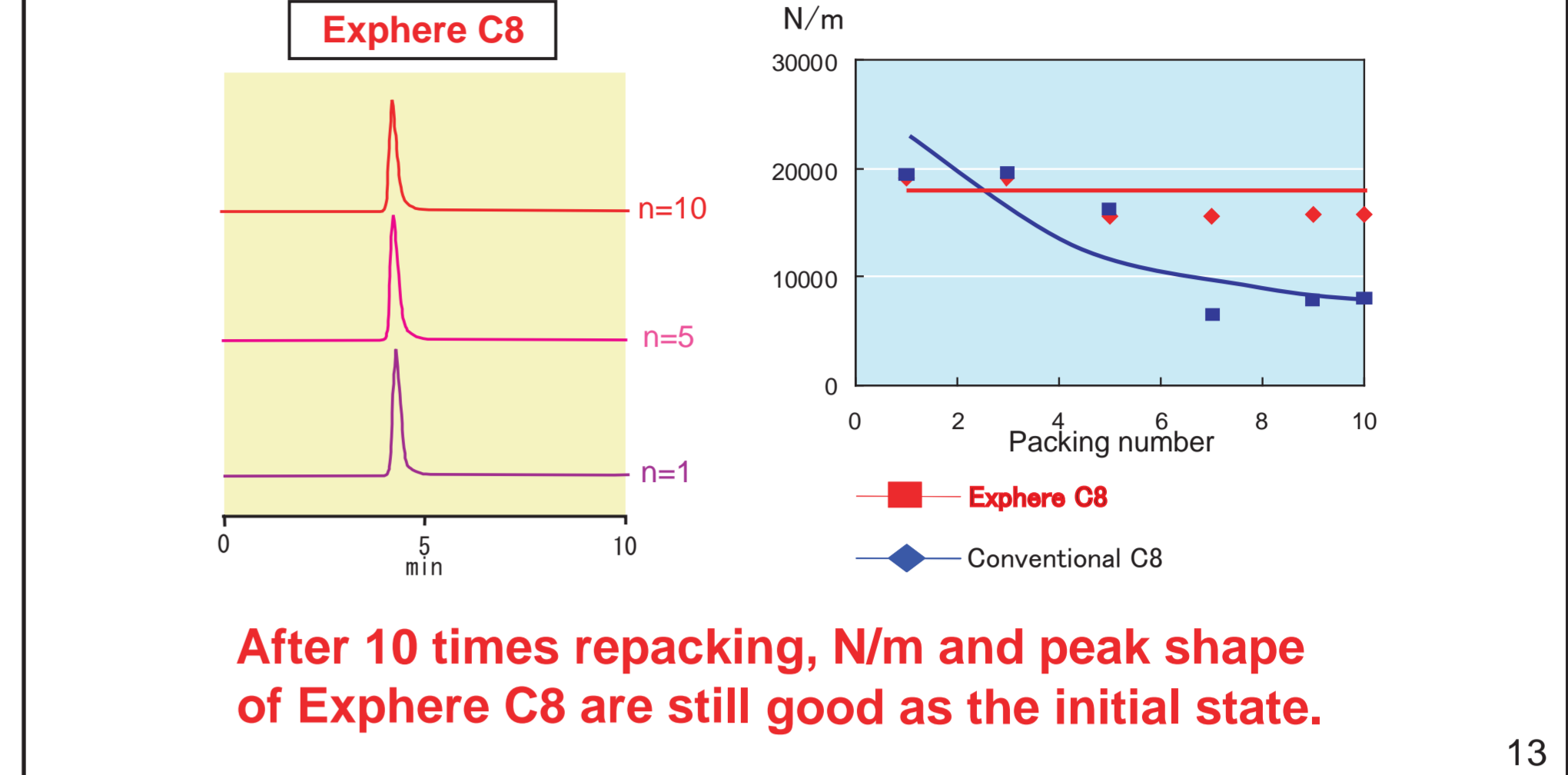
A new high strength silica gel and a bonding technology based preparative bulk packing materials for HPLC have been developed to provide improved recovery, selectivity, and longer life time for the preparative peptide separations. The novel preparative silica particle was successfully prepared by the new generation process, which allows the higher gel density than typical silica gel and the particle size distribution would be practically mono-dispersed character. For the effective reversed phase peptide separations, pore size and pore volume of these new particle were optimized depending on the molecular weight of peptides. To enhance chemical stability and selectivity under the typical peptide purification conditions, the combination of chemical bonding method and functional group density was optimized for maximum performance.

By repeated packing and unpacking of this synthesized gel with large dynamic axial compression column, it was demonstrated that no fine has appeared and no back pressure increasing has occurred comparing to commercially available packing materials. Also cost effective peptide purification with high loadability, productivity, and recovery was achieved with significant small and large peptides.

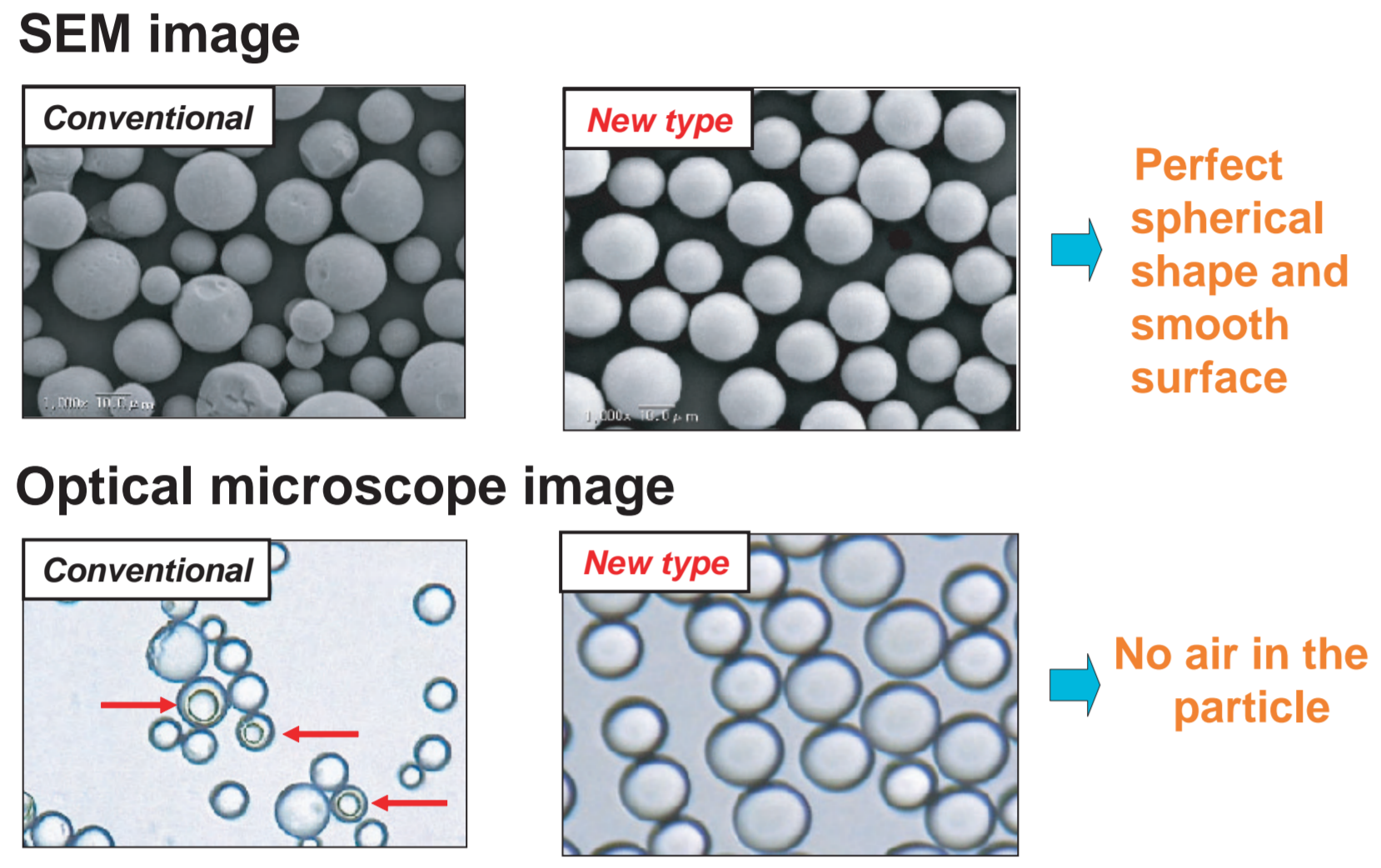
Peptides separation using C18 gel (15 μm, 12 nm)



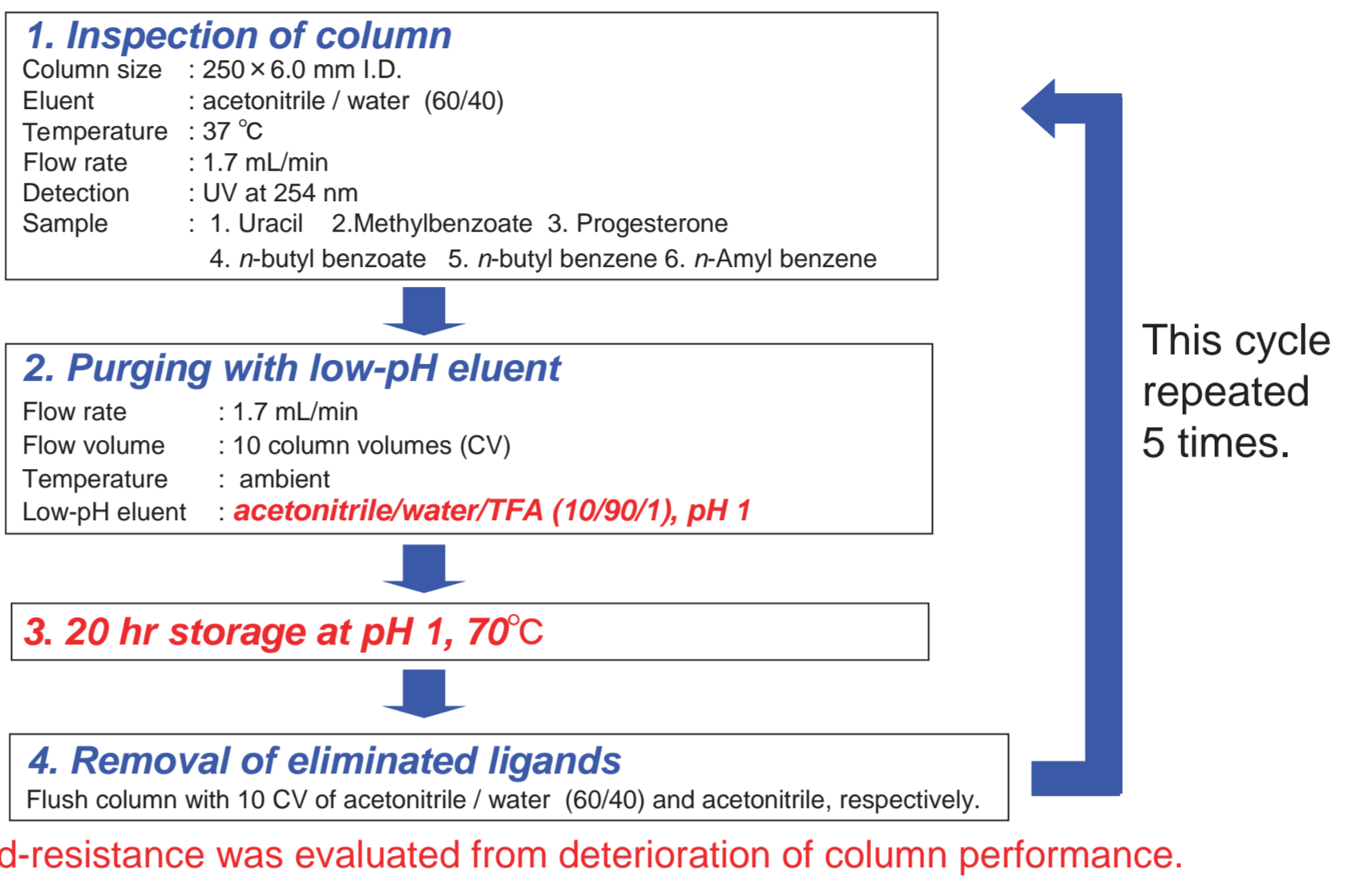
Change of column efficiency after repacking on C8 gel (15 μm, 20 nm)



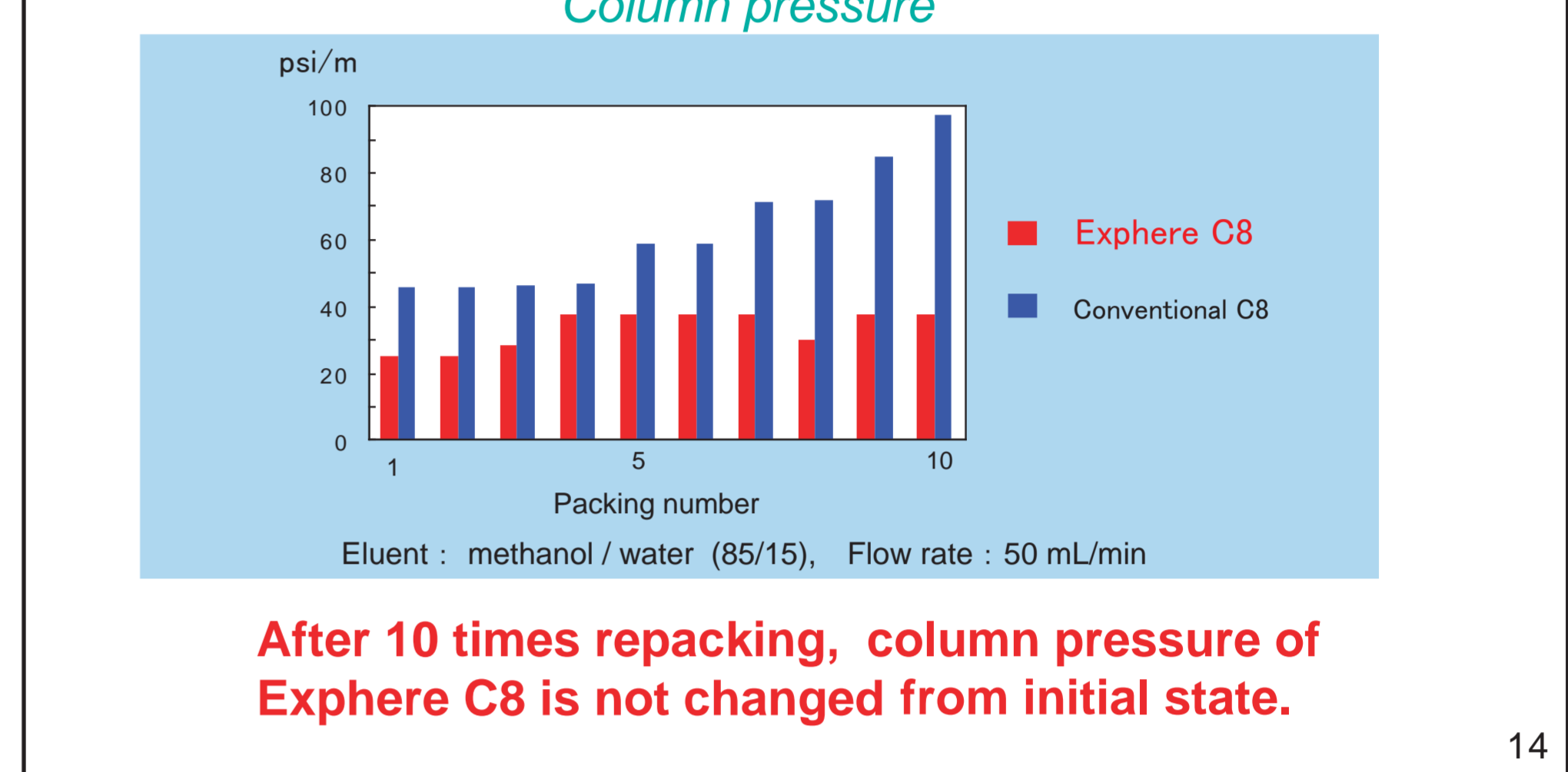
New generation silica gel images



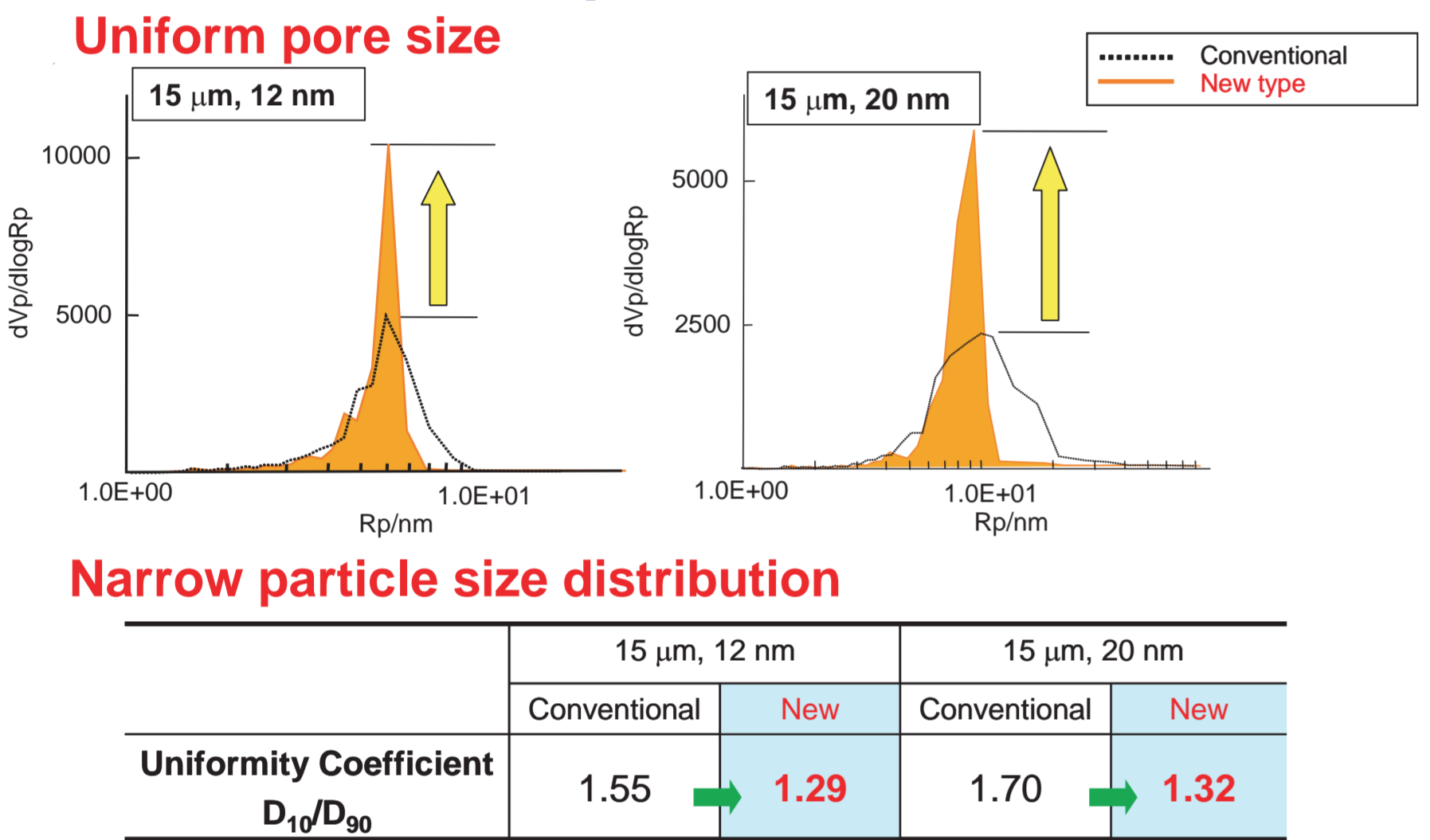
Low-pH stability Test (pH 1, 70°C)



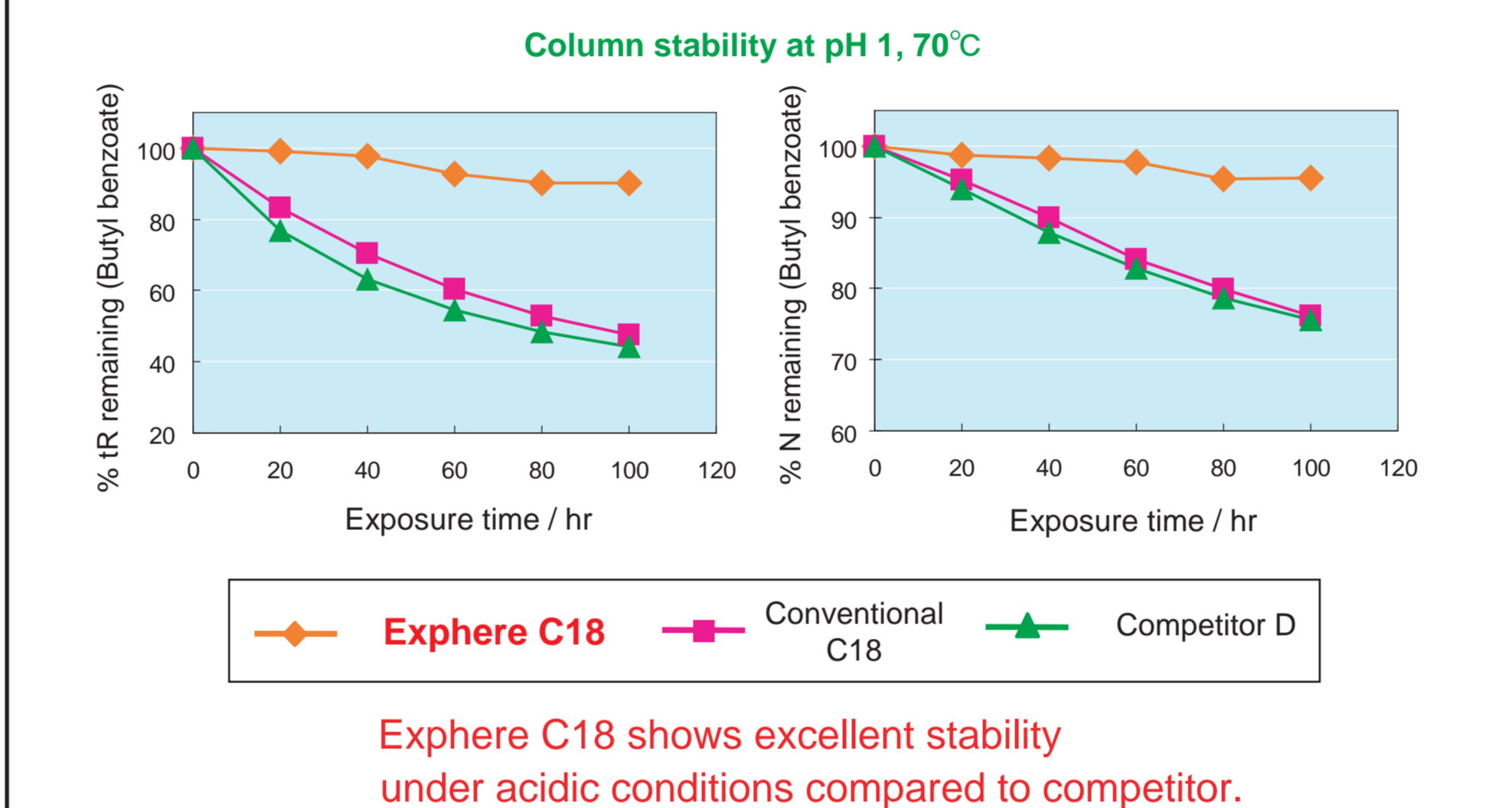
Change of column pressure after repacking on C8 gel (15 μm, 20 nm)



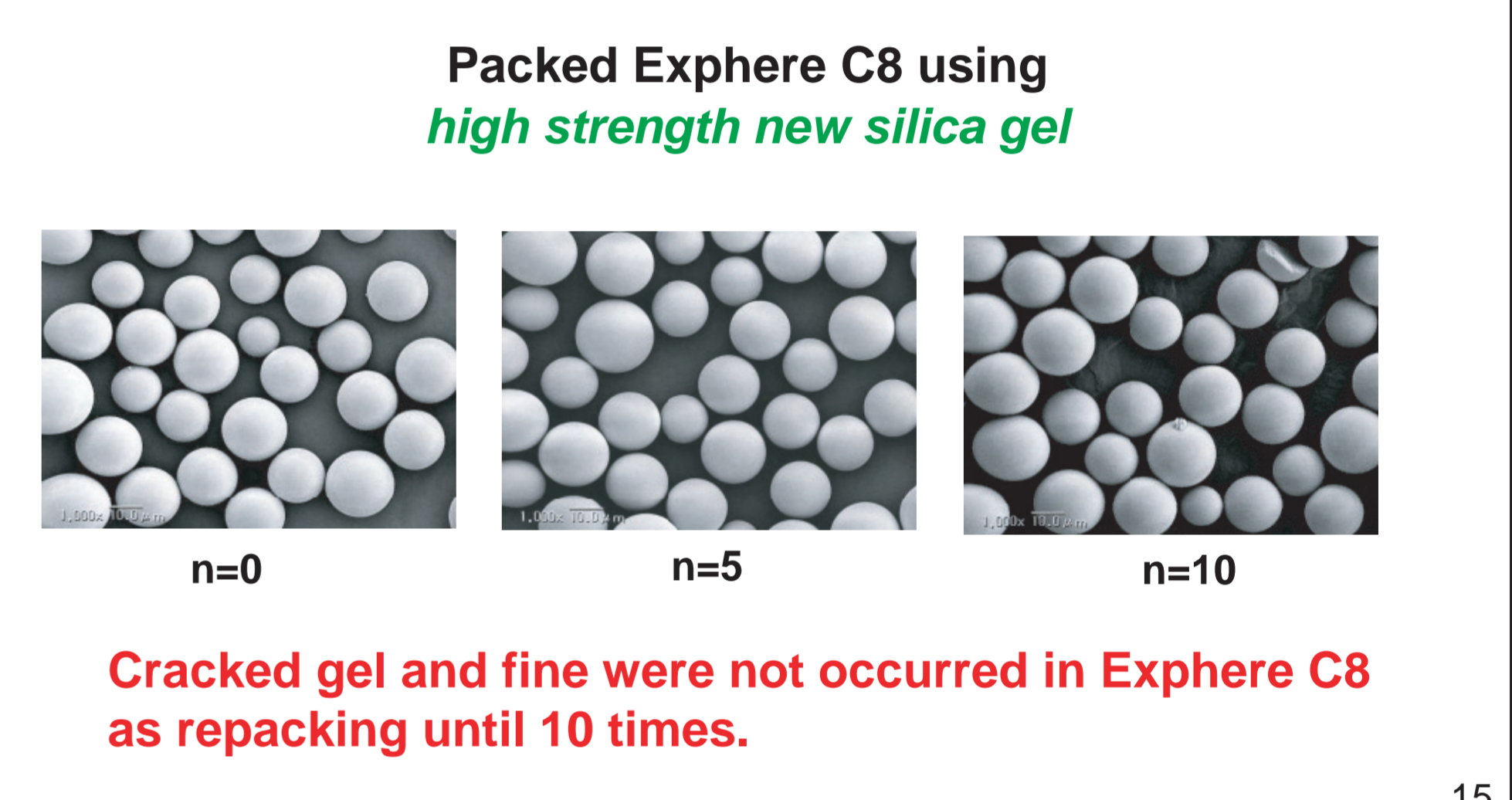
Pore size and particle size distribution



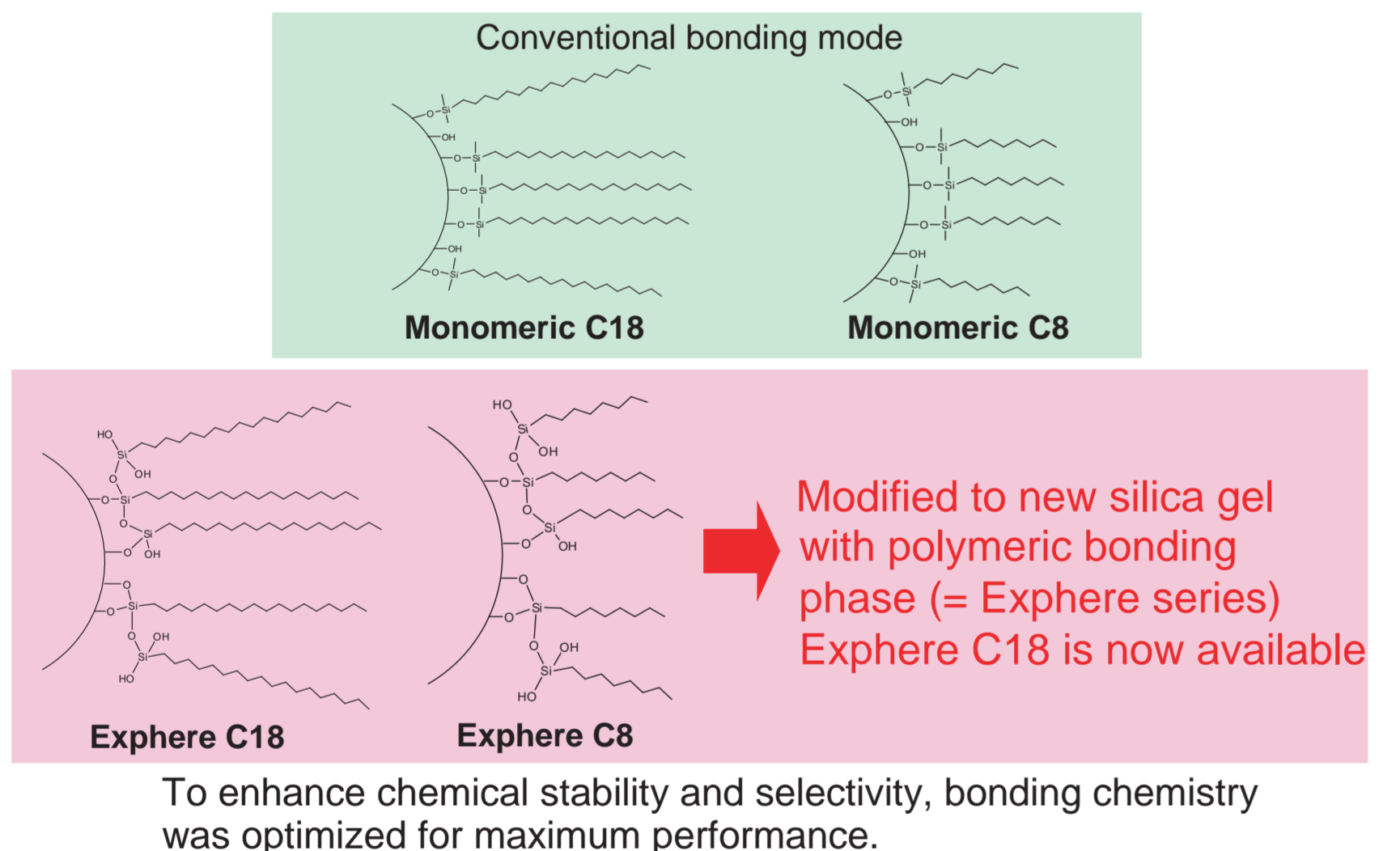
Comparison of Low-pH stability for C18 gel (15 μm, 12 nm)



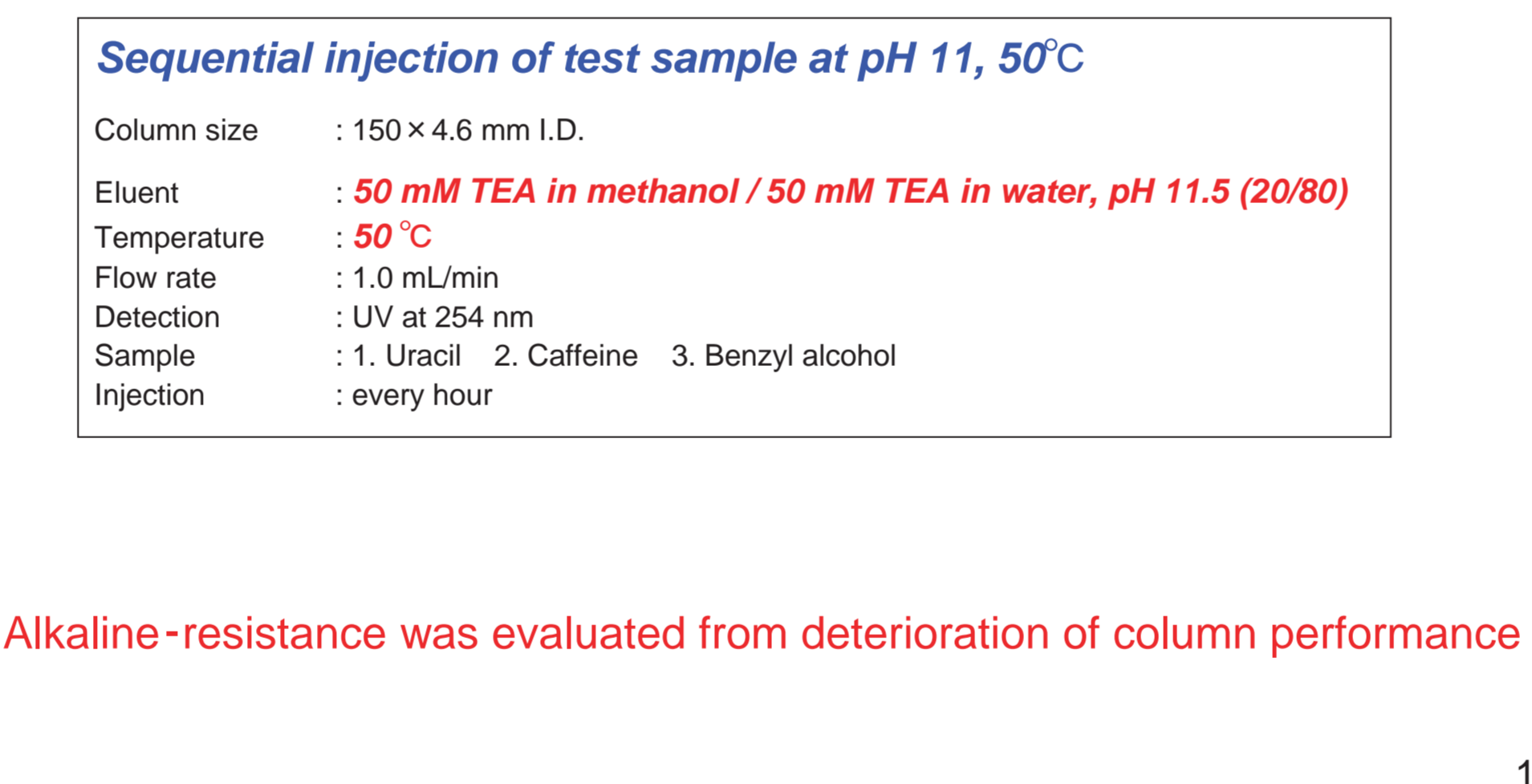
SEM images of packed C8 gel (15 μm, 20 nm)



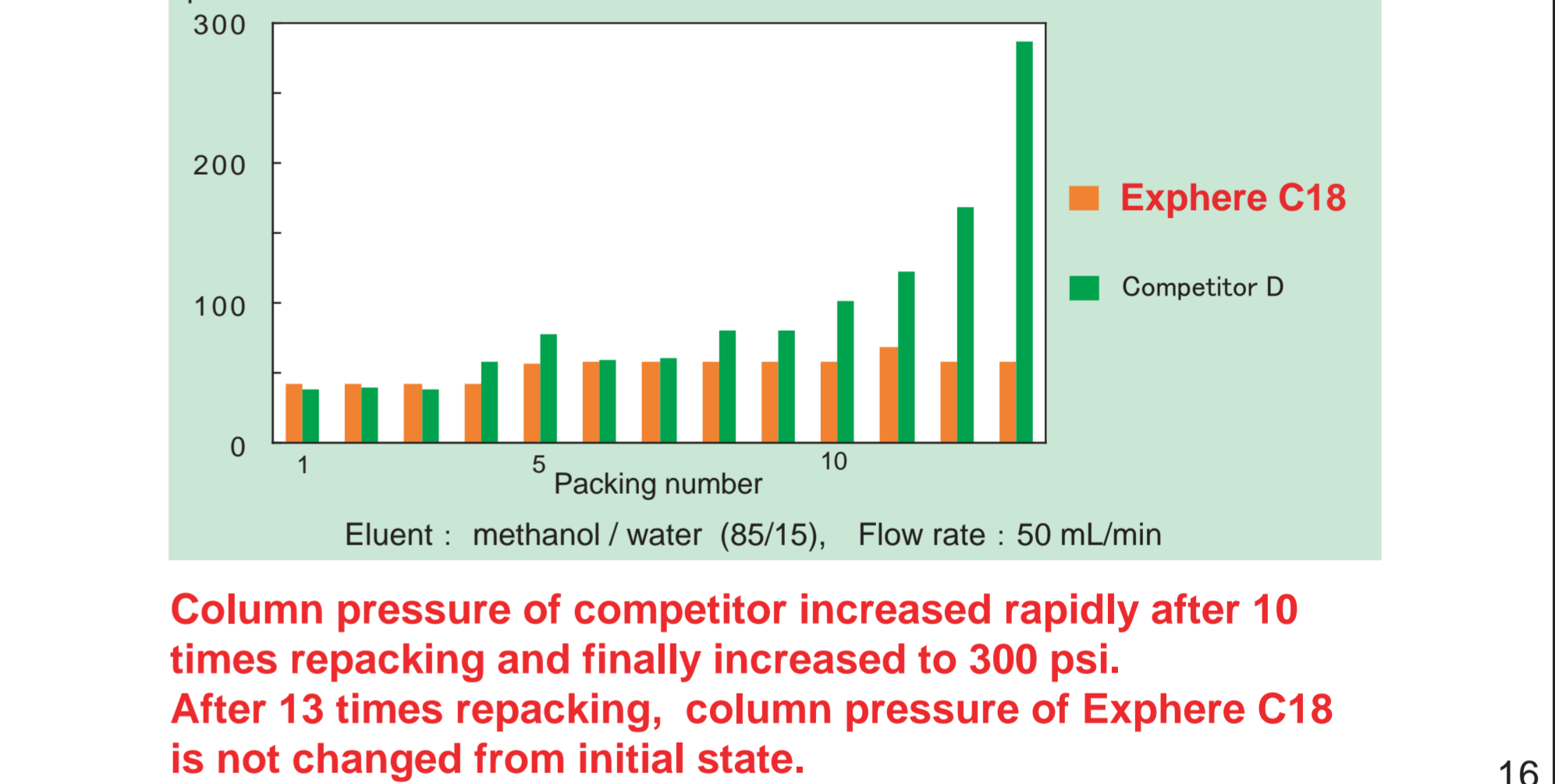
Choosing of bonding mode



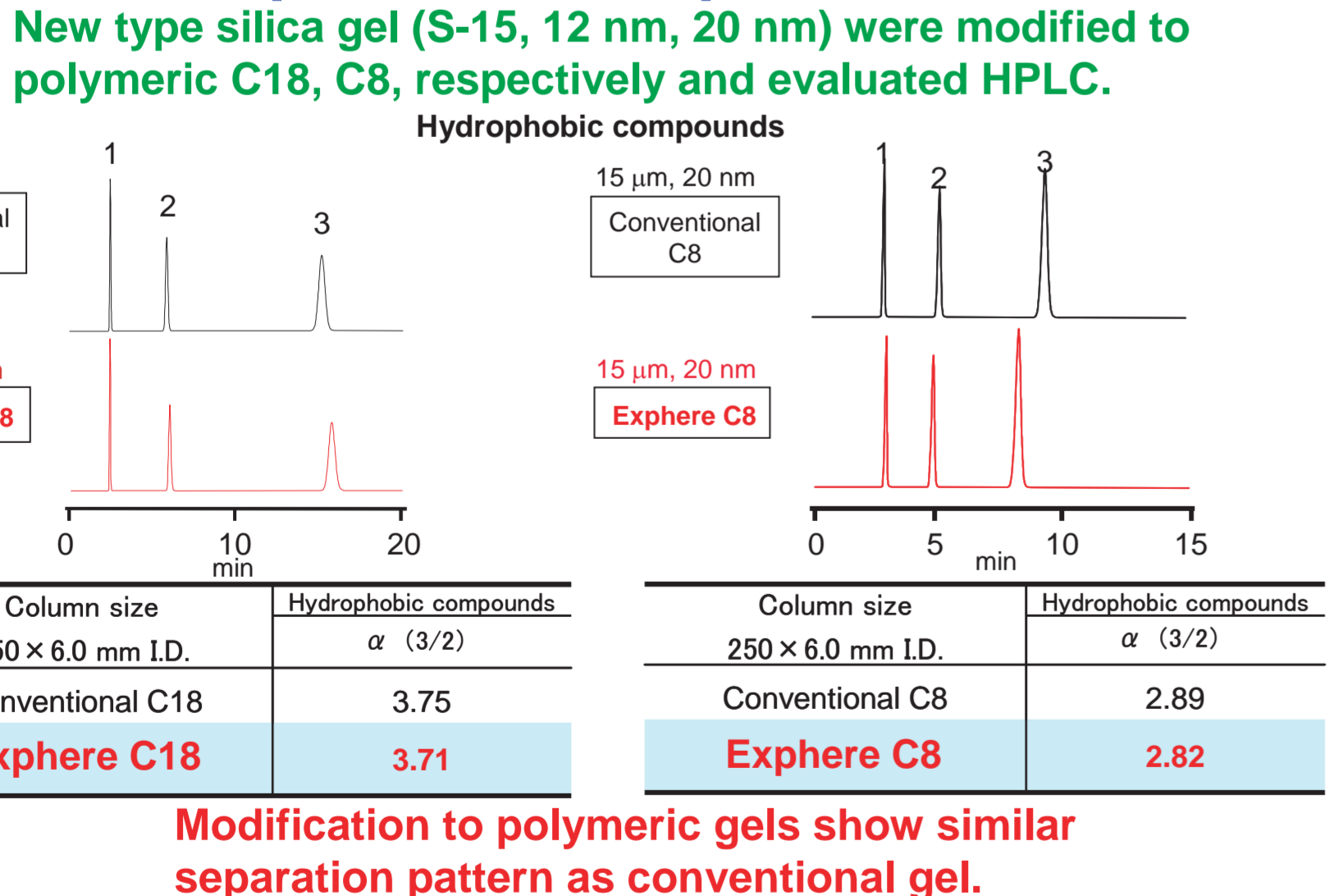
High-pH stability test (pH 11, 50°C)



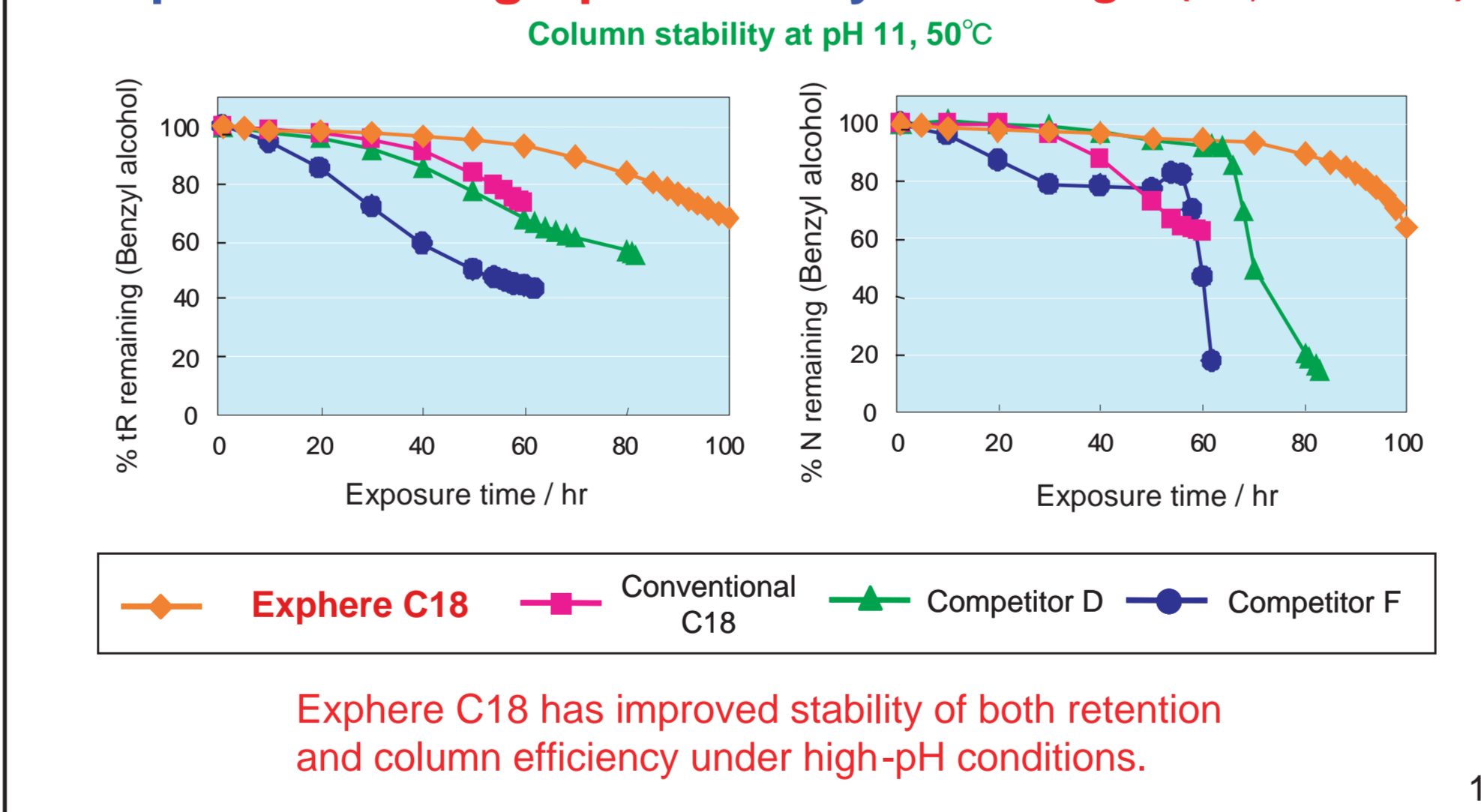
Change of column pressure after repacking on C18 gel (15 μm, 12 nm)



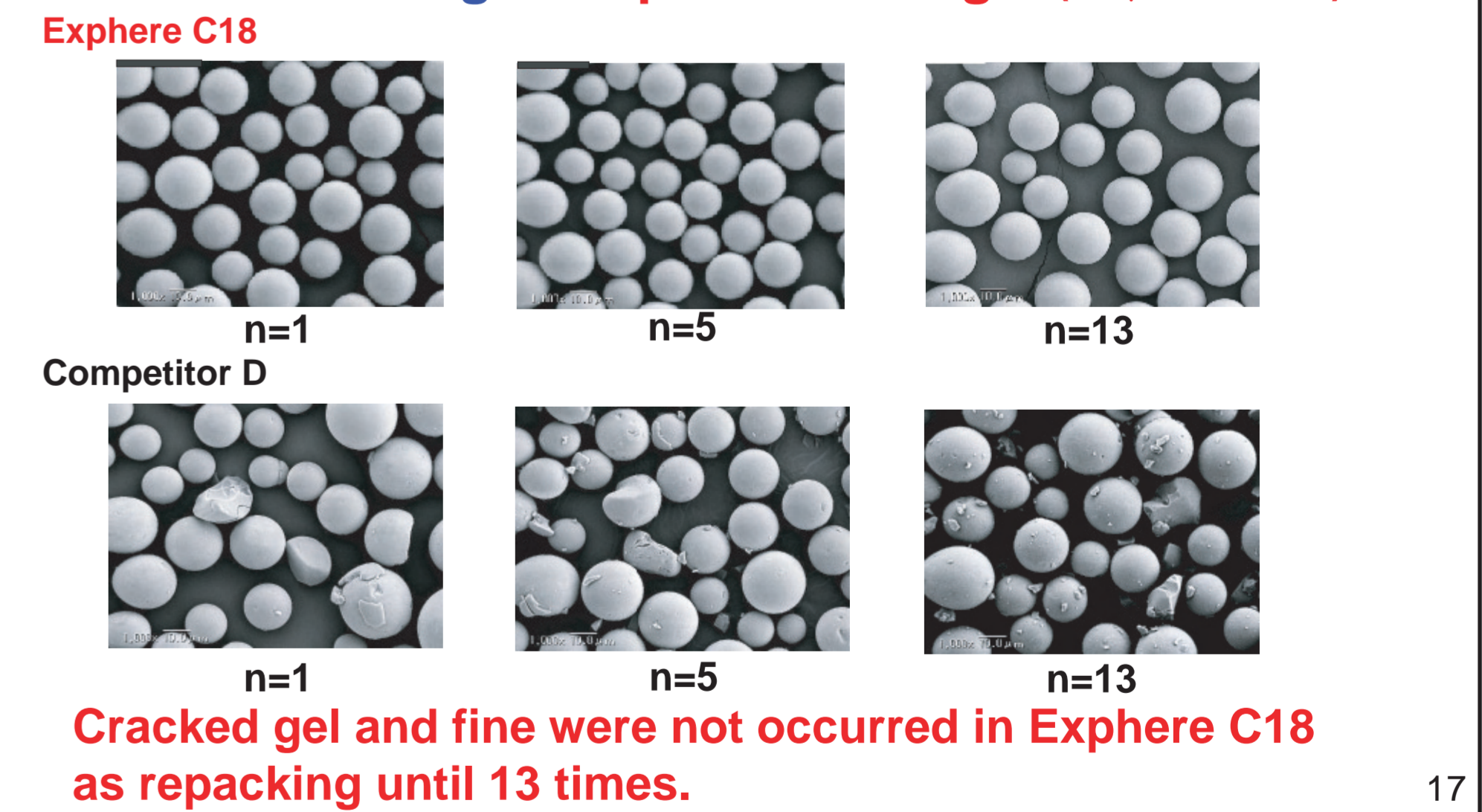
Comparison of inspection test



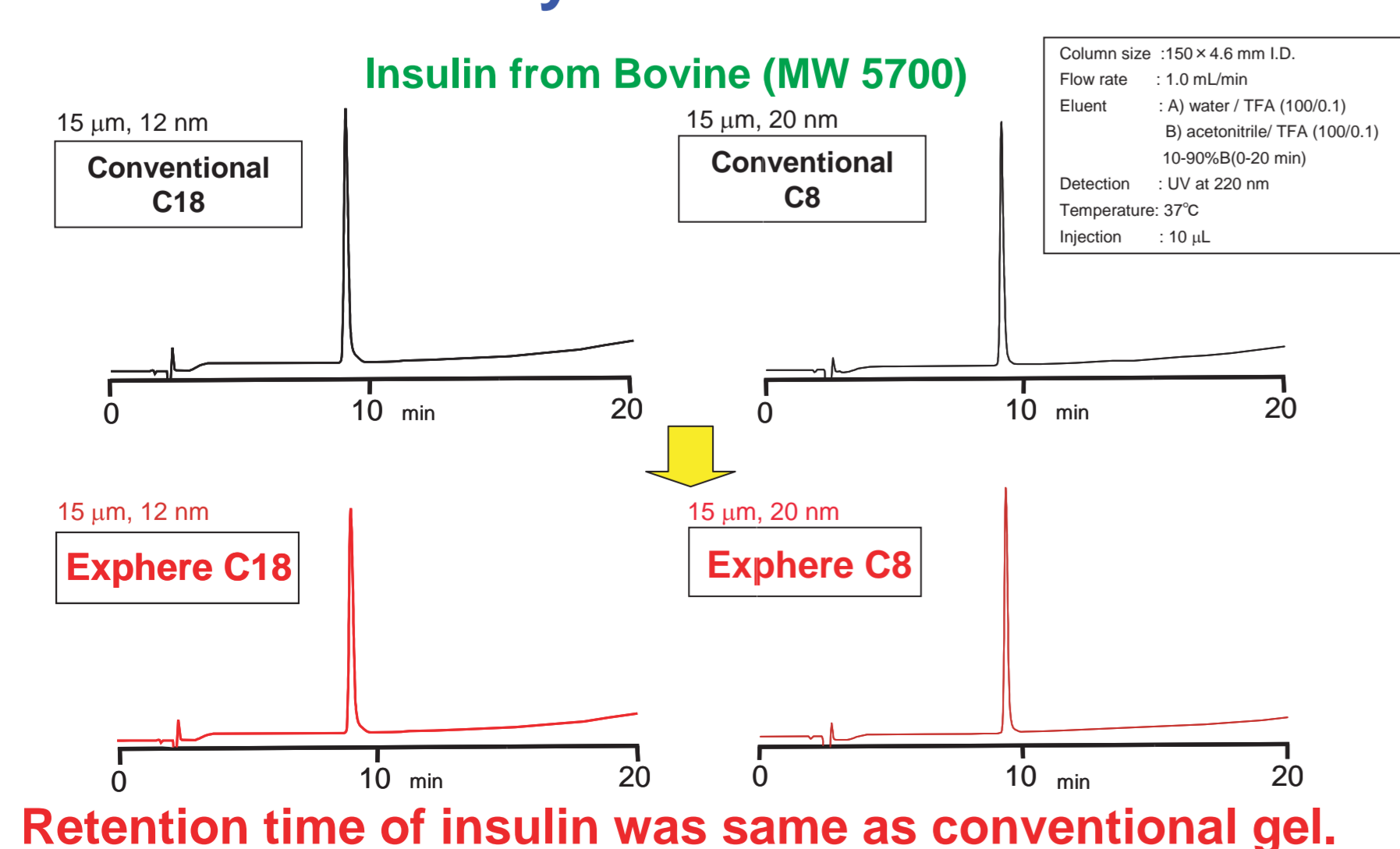
Comparison of High-pH stability for C18 gel (15 μm, 12 nm)



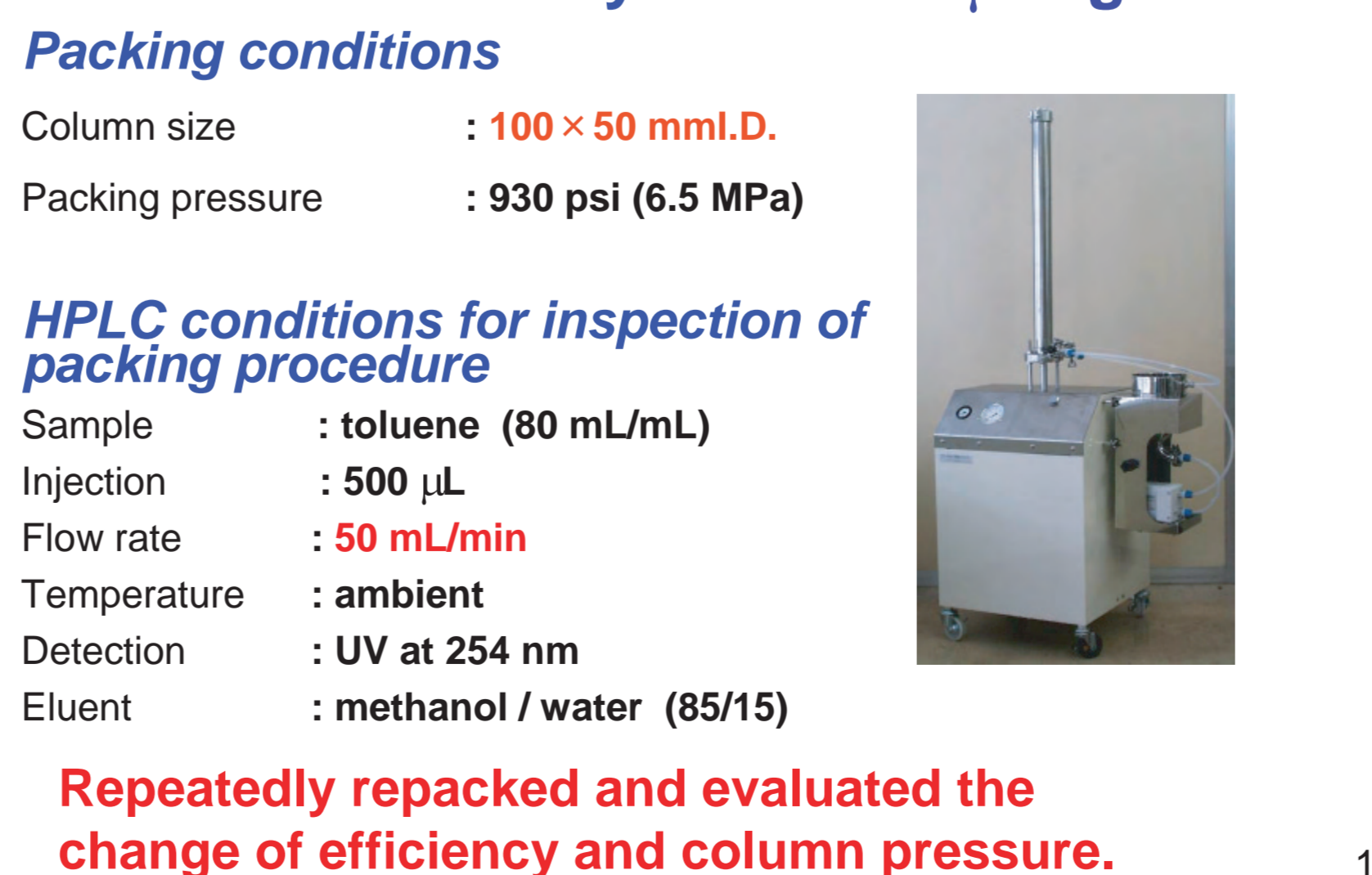
SEM images of packed C18 gel (15 μm, 12 nm)



Analysis of insulin



Mechanical stability test of 15 μm gel



Summary

Performance of HPLC
Exphere series are new bulk products using new silica gel with polymeric bonding phase. The column of Exphere C8 shows lower pressure than conventional columns. Exphere C18 showed improved peak shape of peptides. In addition, the column using new silica gel shows same retention time of insulin as conventional gel.

Chemical stability test
Newly developed gel shows excellent stability under acidic and alkaline conditions due to modification to polymeric C18.

Mechanical stability test
Exphere series show high mechanical stability, therefore peak shapes and column performance are as good as the initial state after 10 times repacking procedure. High mechanical stability ensures longer life time and reduce your cost.