2. Ability to Self-assemble

1) Self-assembly Behaviors of BC (10^{-4} M in THF)

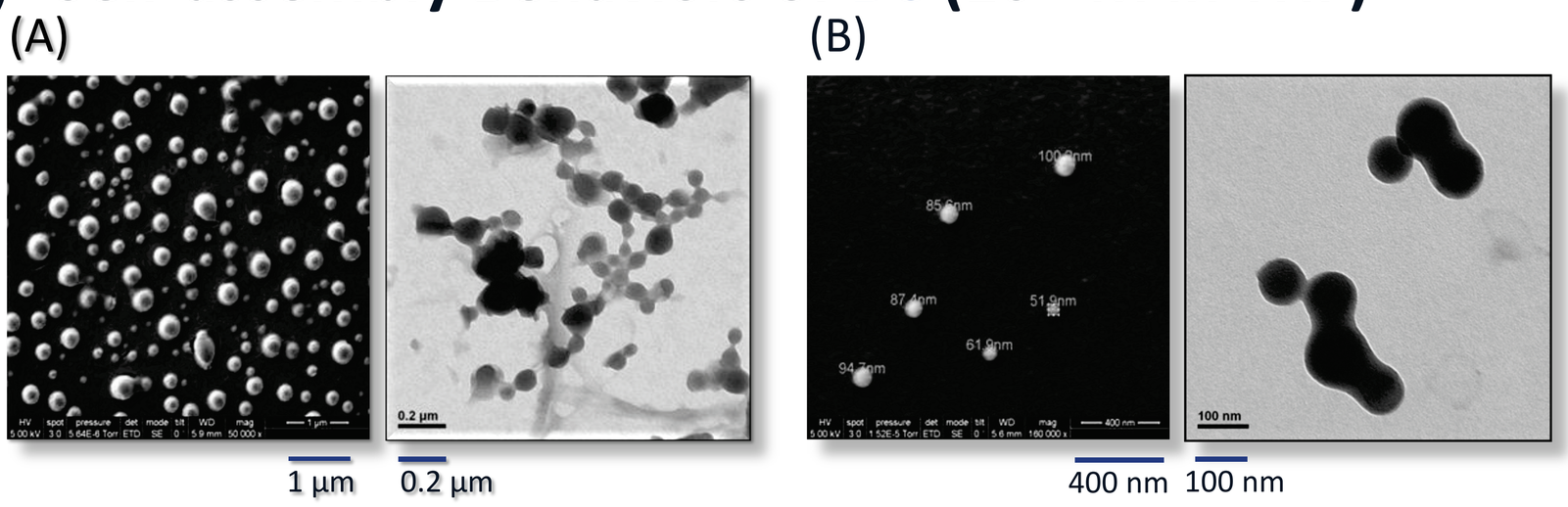

Figure 2. SEM and TEM images of **BC** in different solvents.
(A) THF (Tetrahydrofuran)
(B) THF : MeOH (1:5)
(C) THF : Cyclohexane (1:5)
(D) THF : Toluene (1:5)
(E) Toluene

1. SEM and TEM results show that **BC** is able to self-assemble into discrete spheres in THF and THF/MeOH mixed solutions (Fig. 2 A and Fig. 2 B), while not observed in cyclohexane and toluene. Instead, aggregates without specific features were formed (Fig. 2C, 2D, and 2E).
2. Cyclohexane and toluene can reduce van der Waals interactions. In addition, toluene can weaken intermolecular π-π stacking.
3. Due to the interference of hydrogen bonding interactions, the observed spherical structures of **BC** in THF containing MeOH is not as good as in pure THF (Fig. 2 B vs. Fig. 2 A).
4. *Similar self-assembly behaviors have also been found for **GC** molecule in various solvents.*

2) Characterization of nano structure with high resolution TEM

The nature of nano spheres was analyzed with high resolution TEM. The result (Fig. 4) clearly shows it is *hollow*, indicating the formation of nano *vesicles* from the molecular self-assembly of **BC** in THF.

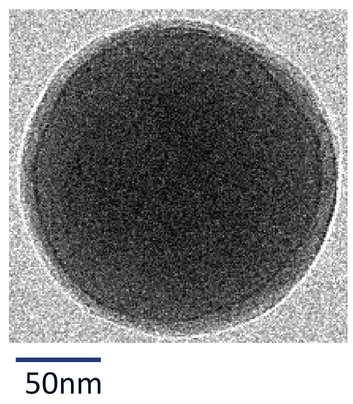

Figure 3. Hollow structure observed by TEM

3) Dynamic light scattering analysis of BC solution

The formation of nano vesicles was spontaneously achieved in the THF solution. This assumption was verified by dynamic light scattering (DLS) analysis of **BC** (10^{-4} M) in THF, showing an average particle size of ~160 nm (Fig. 4), which is consistent with TEM analysis.

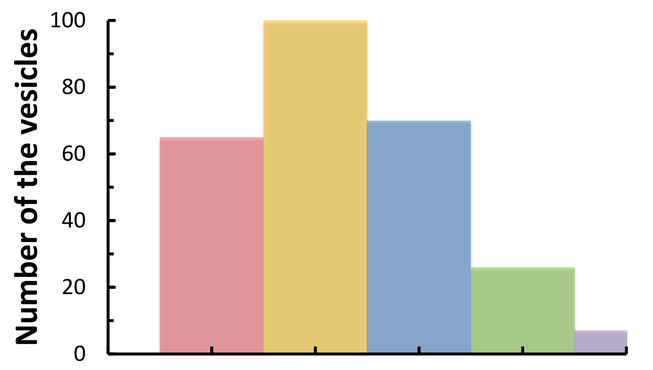

Figure 4. DLS size analysis of **BC** (10^{-4} M) in THF

3. Energy transfer behavior

1) Energy transfer between BC and GC in solution

1. The emission spectrum of **BC** overlaps with the absorption spectrum of **GC** between 400~500 nm (Fig. 5), This results shows good possibility of performing energy transfer between them.
2. With the addition of **GC** into a **BC** solution, the blue fluorescence (~400 nm) of **BC** was gradually quenched, while the intensity of **GC**'s green fluorescence (~ 550 nm) increases (Fig. 6).
3. Stern-Volmer analysis of the quenching of **BC** emission by **GC** gave a linear plot (Fig. 7). This results indicates that the energy transfer between **BC** and **GC** vesicles is efficient.

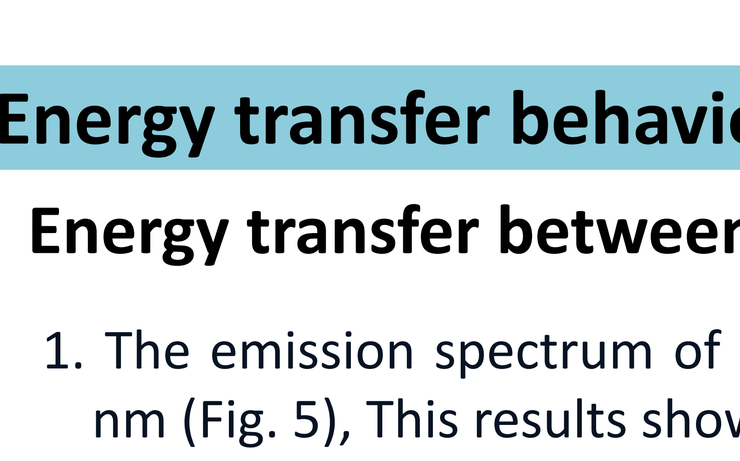

Figure 5. Emission and absorption spectra of **BC** and **GC** (10^{-4} M, in THF)

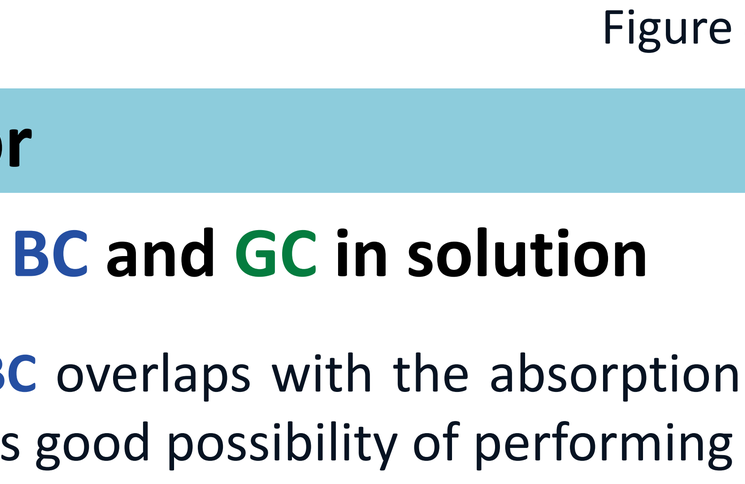

Figure 6. Spectral evolution of **BC** upon adding various ratios of **GC**

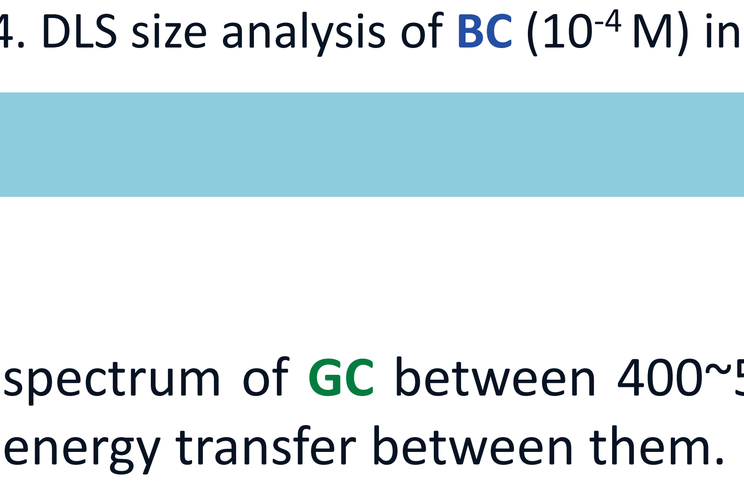

Figure 7. Stern-Volmer analysis of fluorescence quenching of **BC** by **GC**