Emulsion Inversion Induced by CO₂

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Electronic Supplementary Information



Fig. S1 Photographs of AOT/water/isooctane emulsions ([AOT]=0.045 M, $V_{water}/V_{oil}=0.11$) containing chemical dye MO without CO₂ (a) and at different CO₂ pressures of 1.24 MPa (b), 2.74 MPa (c), 2.94 MPa (d), 3.39 MPa (e), and 4.18 MPa (f) under stirring. Photographs g-l correspond to photographs a-f, respectively, which were taken after stopping stirring for 24 hours.



Fig. S2 Photographs of AOT/water/isooctane emulsions ([AOT]=0.045 M, $V_{water}/V_{oil}=0.11$) without gas (a) and at different ethylene pressures of 1.91 MPa (b), 2.59 MPa (c), 2.71 MPa (d), 3.02 MPa (e), and 3.75 MPa (f). The emulsion became more and more transparent with the addition of ethylene, and a transparent emulsion was formed in the pressure range of 2.65-2.90 MPa; then with the increase of ethylene pressure, the emulsion changed into turbid again.



Fig. S3 UV-Vis spectrum of MO in AOT/water/isooctane/ethylene nanoemulsion ([AOT]=0.045 M, $V_{water}/V_{oil}=0.11$) at ethylene pressure of 2.71 MPa. Two absorption bands at 418 nm and 485 nm were observed, corresponding to the absorption bands of MO in solubilized water droplets and continuous water phase, respectively.



Fig. S4 Photographs of AOT/water/isooctane emulsions ([AOT]=0.045 M, $V_{water}/V_{oil}=0.11$) without gas (a) and at different propylene pressures of 0.46 MPa (b), 0.72 MPa (c), 0.82 MPa (d), 0.86 MPa (e), and 0.91 MPa (f). The emulsion changed to more and more transparent with the addition of propylene, and a transparent emulsion was formed in the pressure range of 0.78-0.84 MPa; the emulsion changed to turbid again with further adding propylene.



Fig. S5 UV-Vis spectrum of MO in AOT/water/isooctane/propylene nanoemulsion ([AOT]=0.045 M, $V_{water}/V_{oil}=0.11$) at propylene pressure of 0.82 MPa. Two absorption bands at 415 nm and 484 nm were observed, corresponding to the solubilized water and bulk water, respectively.



Fig. S6 Photographs of AOT/water/isooctane emulsions ([AOT]=0.045 M, $V_{water}/V_{oil}=0.11$) without gas (a) and at different isobutane pressures of 0.11 MPa (b), 0.18 MPa (c), 0.21 MPa (d). A transparent emulsion was formed in the pressure range of 0.16-0.19 MPa; then the emulsion changed to turbid again with further increasing isobutene pressure.



Fig. S7 UV-Vis spectrum of MO in AOT/water/isooctane/isobutane nanoemulsion ([AOT]=0.045 M, $V_{water}/V_{oil}=0.11$) at isobutane pressure of 0.18 MPa. Two absorption bands located at 420 nm and 492 nm correspond to the solubilized water and bulk water, respectively.