Movie S1: Real-time molecular dynamics of the equilibrium 1:0 mixture at the high temperature. It shows every 100 fs dynamics per a slide.

Movie S2: Real-time molecular dynamics of the nonequilibrium 1:0 mixture at the high temperature. It shows every 100 fs dynamics per a slide.

Movie S3: Real-time molecular dynamics of the equilibrium 3:1 mixture at the high temperature. It shows every 100 fs dynamics per a slide.

Movie S4: Real-time molecular dynamics of the nonequilibrium 3:1 mixture at the high temperature. It shows every 100 fs dynamics per a slide.

Movie S5: Real-time molecular dynamics of the equilibrium 1:1 mixture at the high temperature. It shows every 100 fs dynamics per a slide.

Movie S6: Real-time molecular dynamics of the nonequilibrium 1:1 mixture at the high temperature. It shows every 100 fs dynamics per a slide.

Movie S7: Real-time molecular dynamics of the equilibrium 1:3 mixture at the high temperature. It shows every 100 fs dynamics per a slide.

Movie S8: Real-time molecular dynamics of the nonequilibrium 1:3 mixture at the high temperature. It shows every 100 fs dynamics per a slide.

Movie S9: Real-time molecular dynamics of the equilibrium 0:1 mixture at the high temperature. It shows every 100 fs dynamics per a slide.

Movie S10: Real-time molecular dynamics of the nonequilibrium 0:1 mixture at the high temperature. It shows every 100 fs dynamics per a slide.

Movie S11: Real-time molecular dynamics of the equilibrium 1:0 mixture at the low temperature. It shows every 100 fs dynamics per a slide.

Movie S12: Real-time molecular dynamics of the nonequilibrium 1:0 mixture at the low temperature. It shows every 100 fs dynamics per a slide.

Movie S13: Real-time molecular dynamics of the equilibrium 3:1 mixture at the low temperature. It shows every 100 fs dynamics per a slide.

Movie S14: Real-time molecular dynamics of the nonequilibrium 3:1 mixture at the low temperature. It shows every 100 fs dynamics per a slide.

Movie S15: Real-time molecular dynamics of the equilibrium 1:1 mixture at the low temperature. It shows every 100 fs dynamics per a slide.

Movie S16: Real-time molecular dynamics of the nonequilibrium 1:1 mixture at the low temperature. It shows every 100 fs dynamics per a slide.

Movie S17: Real-time molecular dynamics of the equilibrium 1:3 mixture at the low temperature. It shows every 100 fs dynamics per a slide.

Movie S18: Real-time molecular dynamics of the nonequilibrium 1:3 mixture at the low temperature. It shows every 100 fs dynamics per a slide.

Movie S19: Real-time molecular dynamics of the equilibrium 0:1 mixture at the low temperature. It shows every 100 fs dynamics per a slide.

Movie S20: Real-time molecular dynamics of the nonequilibrium 0:1 mixture at the low temperature. It shows every 100 fs dynamics per a slide.