

Supplementary information

Saccharide-induced modulation photoluminescence in microgels

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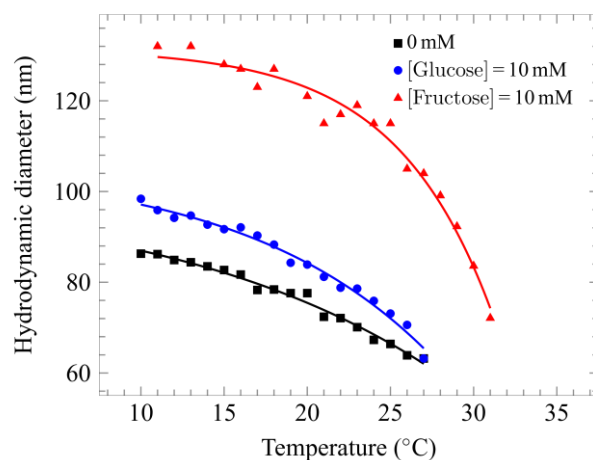


Figure S1: Evolution of the hydrodynamic diameter as a function of temperature in different glucose or fructose concentrations for pNIPAM-PBA-Ru2 microgels. Phosphate buffer 20 mM, pH 8.5. The curves are interrupted at a temperature where the microgels reach a collapsed state. Above this temperature, the microgels are flocculated.

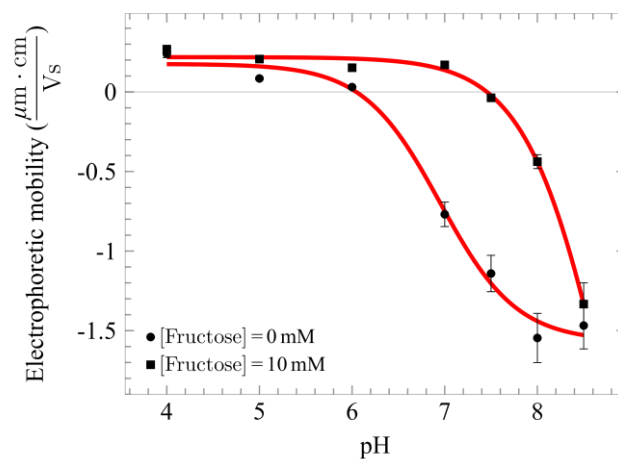


Figure S2. Electrophoretic mobility of the pNIPAM-PBA-Ru1 functionalized microgels as a function of pH, $T = 25\text{ }^{\circ}\text{C}$.

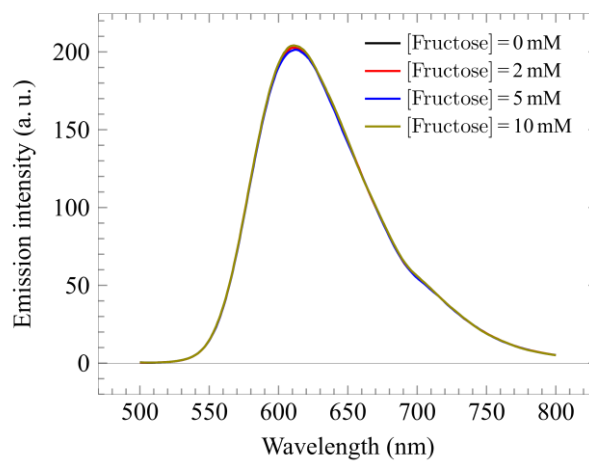


Figure S3. Influence of the presence of fructose on the emission properties of $[\text{Ru}(\text{bpy})_3]^{2+}$ in solution. Phosphate buffer 20 mM, pH 8.5, $T = 25^{\circ}\text{C}$.

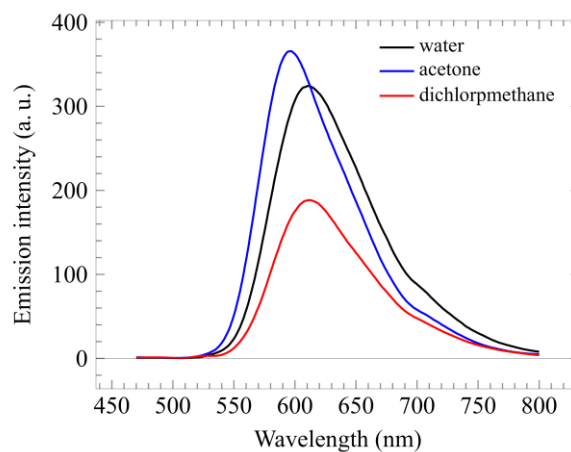


Figure S4. Influence of the solvent polarity on the emission properties of $[\text{Ru}(\text{bpy})_3]^{2+}$ in solution. $T = 25^\circ\text{C}$.

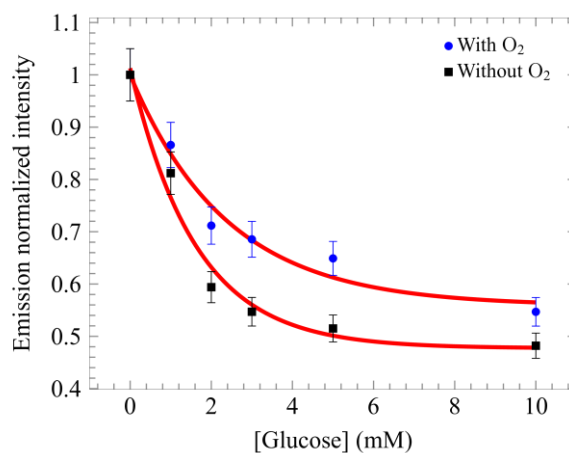


Figure S5. Influence of the presence of oxygen on the emission properties of pNIPAM-PBA-Ru1 as a function of fructose concentration. Phosphate buffer 20 mM, pH 8.5, $T = 25^\circ\text{C}$. The concentration of the ruthenium complex is $10\ \mu\text{M}$.

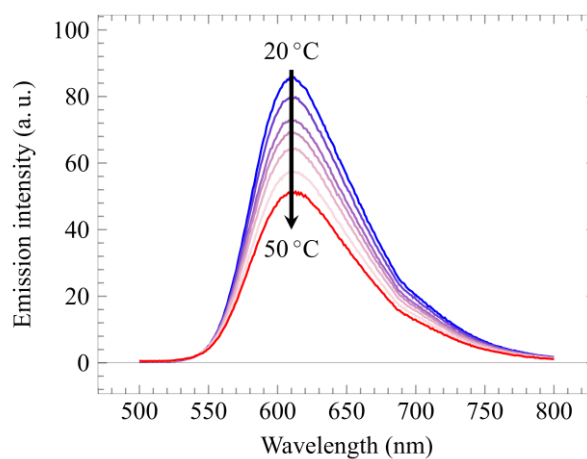


Figure S6. Influence of temperature on the emission properties of pNIPAM-Ru microgel in solution. Phosphate buffer concn. 4 mM, pH 7.4.

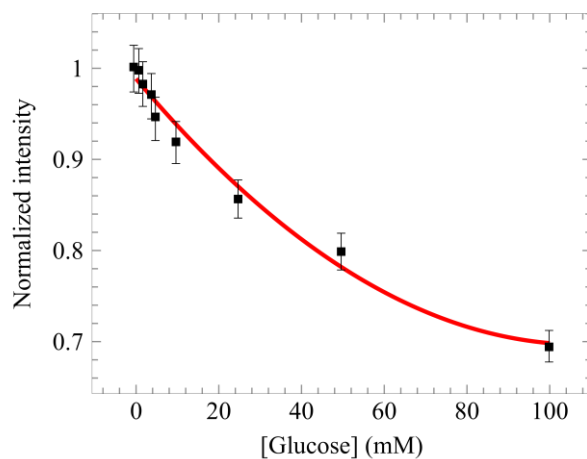


Figure S7. Dependence of pNIPAM-PBA-Ru1 emission intensity on glucose concentration. PL experiments were performed in a 20 mM PBS solution (pH 8.5). The concentration of the ruthenium complex was 10 μ M.

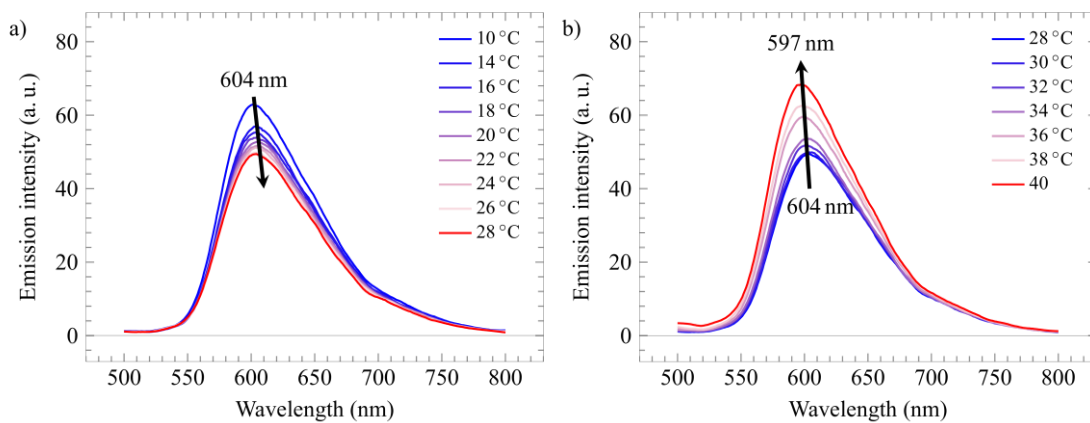


Figure S8: Influence of temperature on the emission properties for pNIPAM-PBA-Ru1 microgels in 5 mM fructose solution. Phosphate buffer concn. 20 mM, pH 8.5.

Table S1. Emission lifetime and quantum yield (Φ_f) of the microgels and $[\text{Ru}(\text{bpy})_3]^{2+}$ in the presence / absence of fructose at 25 °C.

Sample	Emission lifetime in air-equilibrated solution (ns)	Emission lifetime in degassed solution (ns)	Emission quantum yield (Φ_f)
$\text{Ru}(\text{bpy})_3^{2+}$ in buffer	450± 25 ns	n.a.	0.04± 0.005
pNIPAM-Ru in buffer	620 ± 25 ns	720± 25 ns	0.063± 0.003
pNIPAM-Ru in buffer + fructose (10 mM)	670± 25 ns	720± 25 ns	n. a.
pNIPAM-PBA-Ru1 in buffer	1550 ±50 ns	1500± 50 ns	0.175±0.018
pNIPAM-PBA-Ru1 in buffer + fructose	680 ±25 ns	840± 25 ns	0.066±0.003
pNIPAM-PBA-Ru2 in buffer	1080 ±50 ns	n.a.	0.062±0.003

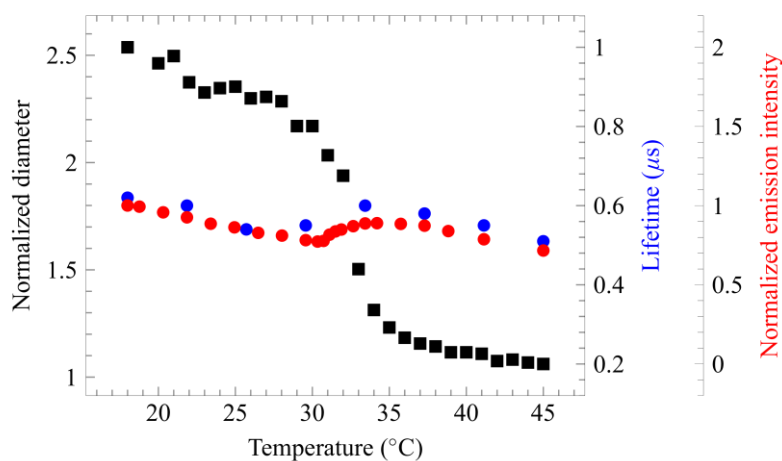


Figure S9. Temperature-dependence of the normalized emission intensity and lifetime of pNIPAM-Ru microgels and their swelling state (normalized hydrodynamic diameter). Phosphate buffer concn. 20 mM, pH 8.5. The concentration of the ruthenium complex is 10 μM .