Hydrothermal ore deposits that are exploited for gold include both gold-only deposits, such as orogenic deposits, and gold-bearing examples of the common hydrothermal deposits types that are formed around upper-crustal magmatic centres, in particular porphyry and epithermal deposits. Fluid-inclusion data have shown that ore fluids of gold-only deposits are compositionally distinct compared to fluids of other deposit types. This Special Publication includes an up-to-date summary of thermodynamic parameters of aqueous Au species at high temperatures and pressures; a dataset of fluid inclusion properties and compositions from orogenic deposits of different parts of the world; several comprehensive case studies of different types of gold deposits and their fluids from USA, Brazil, Egypt, Slovakia and Bulgaria; and numerical modelling aimed to define key parameters that affect fluid flow and gold deposition at a range of scales.