

Representation of the Concentration Quality

The problem occurs when we represent an instance of the solute when there is in fact none - the case of true concentration being 0. The solution is to use a universal restriction on the relation to the solute rather than an existential, and have the relation not be filled (i.e. absent) in the case where there is not.

Notice that in the case that there is no zinc there is no instance of zinc (properly "portion of zinc"). The zero, when there is one, is part of an information entity about the quality. The quality, while it generally refers to some zinc, might not. What it represents when there is no zinc is admittedly odd, but presumably it is something to do only with the solute. Perhaps "Solute lacking Zinc".

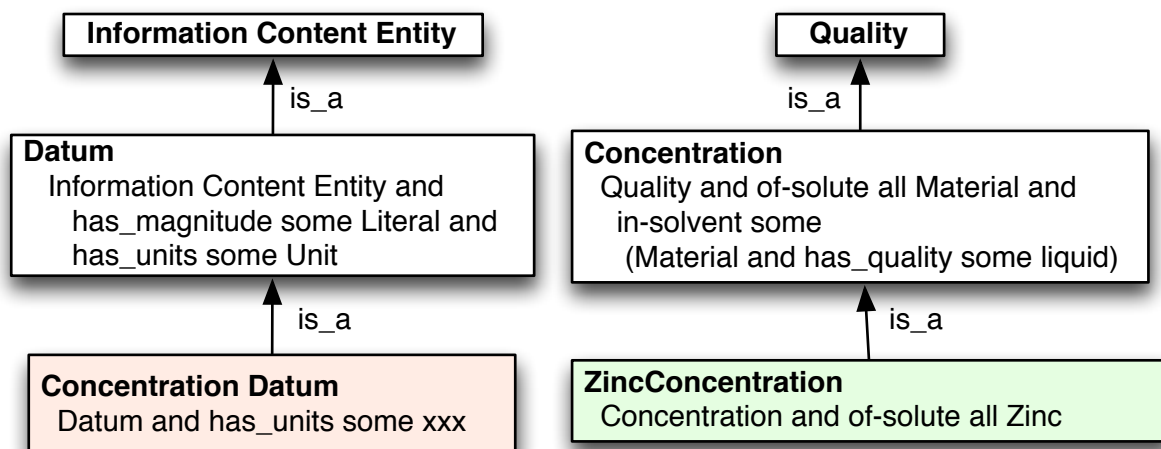
There is no implication that a zero magnitude datum implies that there is in fact no zinc - this saves us from the "limit of detectability" problem - that we might measure nothing because the instrument can't detect that little.

While in the general case, magnitude zero doesn't distinguish between some and no zinc, that can be tightened up for other classes - if the quality were a count of large objects, then the constraint could be tightened to >0 , and then zero magnitude would imply no object.

Note, 2011

This diagram, which I drew in early 2008, is not quite in sync with the representation used by OBI. Currently OBI has 'molecular concentration' as subclass of PATO's 'quality of related physical entities' with the axiom ('inheres in' some material_entity) and (towards some 'scattered molecular aggregate') - *Alan Ruttenberg*

Class definitions



Instance level

