An unspeakable love of gold

* There are some moments when you need to keep quiet. What you've got to say may be relevant, perhaps even interesting, but there are times when your materials science geek needs to take a back seat to the occasion. For instance, your own wedding, when you are about to exchange rings with your prospective husband or wife, is not the time to muse on the significance of gold. In fact it is not the time for rational thought at all.
* Nevertheless, sometimes these thoughts creep into a mind trained to question everything. The main thing is to resist articulating them. You definitely should not think about the fact that the quantity of gold available to humans has remained almost unchanged for hundreds of years. Increasing marginally through mining, and decreasing through being sent off into the solar system as part of spacecraft. If gathered together, all the gold in the world would fit inside a large town house. This makes gold extremely rare, and so extremely valuable.
* These days nanoparticles are the cutting edge for gold. Being extremely stable, inert, and useful reagents, they are fast becoming the workhorses of the Nano world. They are being used to investigate cancers, trap toxins, and build all manner of nanostructures. Of course, the ability to control tiny gold particles is nothing new, creating colloidal suspensions of gold was one of the ancient ways to colour glass red. However, during your wedding ceremony, resist the urge to point to the red-stained glass windows, and whisper in your beloved's ear, "You see dear, nanotechnology is just a new word for an ancient technology."
* For much of history, gold was thought of as a material manifestation of perfection. In particular, the alchemists believed that metals contained different ratios of the elemental substances mercury and sulphur. In certain combinations, these substances produced metals such as lead and iron, but in the perfect combination they produced gold. Hence the idea that in the right circumstances, lead might be turned into gold if the ratios were corrected.
* Gold is the most malleable metal on the planet. It can be hammered into a paper so thin that it becomes transparent, appearing blue/green as a result of strong reflection of red and yellow. At a slightly thicker gauge, it becomes gold leaf. A single ounce of gold can be beaten into golf leaf with the fragility and beauty of a butterfly wing but covering 300 square feet. If your marriage doesn't work out, it is possible to beat your wedding ring into gold leaf to cover the whole exterior of a sports car.
* Not that losing out in love will necessarily turn you into a modern Goldfinger, someone who drives around in a golden sports car and "loves only gold", as the classic Shirley Bassey song goes. However, it's still best not to mention this possibility at the wedding. As they say, silence is golden.

Figure 1 Processing Gold

**Chart**

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