



Introducing Health Sciences: Visual Impairment

The Development Lab at Contamac

Commentary

Here in the development lab at Contamac they're mixing the formulation that'll give the required properties to their hydrogel materials. As well as researching which combinations will give rise to the next generation of hydrogels.

Caroline Mannion-Robert is the Materials Development Manager.

Int

What kind of monomers did you use?

Caroline

One of the basic monomer that we're using is called hemer and one can you see is that the OH function has got an oxygen which isnegative, and that's going to be, that's going to create hydrogen bonding with the water, and that's going to give you material with 38% water content.

Int

Can you improve on that water content?

Caroline

Yes you can. You can by using monomer called accleramide. This is one of the family and it's the same thing, you can see a nitrogen atom and again that's going to improve your water content. You're going to get material up to 80% water content.

Int

But there are drawbacks?

Caroline

Yes there are 'cos you can have 80% but then you can have very, very low mechanical properties, and the material's going to be weak, and when you've got a contact lens and if you want to clean it, it's just going to break.

Int

Just fall apart in your hands?

Caroline

Yes.

Int

So how can you improve on the physical strength?

Caroline

Well you can, by using other monomer, like methyl-methlacate. Here where you can notice that there's no oxygen and nitrogen function, it's only a short chain, carbon chain, and it's going to bring strength to the structure.

Int

What are the cross-linkers that you use?

Caroline

They're all a basic one we're using – it's EGDMA – Ethylene Glycol Dimethacrylate – this is one of the common ones that we're using hemer 38%.

Int

How does that affect the properties of the hydrogen?

Caroline

Well you need to use it because it's going to be part of your network but if you were to use too much, for example, it would decrease the water content.

Int

So what about the future, what does the future hold?

Caroline

Well we recently developed material which was, which had a better water retention, what is it, is you've got more and more people working on the computer and when you're wearing contact lenses you don't blink as much as if normal, you know normal situation, and so your lens gets dehydrated, and it's a common fault obviously, what we've been using is a new type of monomer, like you can see here, and what this monomer has got it's got 2OH function, what's going to happen is that more water is going to be burnt into the material and obviously it's going to have better water retention, and so less dehydration on your eyes, and so better comfort for the user really.