

## The Magnet-less, Cellulose Speaker

Written by Bob Snyder  
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In a part of the world known for its loudspeaker technology as well as its forests, Sweden's KTH Royal Institute of Technology create a new category of loudspeaker with **magnetic cellulose** to generate sound without need of a magnet.

Cellulose, that's right. That makes what's in this speaker box a DNA relative to its own wooden cabinet.

KTH says the sound quality isn't at all "wooden" and is "at least as good as in conventional speakers – possibly better because of the even distribution of forces created in the membrane." (And you can listen to the sound quality for yourself using the link at the end of this story.)

KTH have patented the material, created by attaching magnetic nanoparticles to cellulose nanofibrils. The cellulose comes from renewable wood pulp and involves environmentally-friendly water chemistry.

Researchers create a solution with ferromagnetic salts at 90 degree Celsius, mix in cellulose fibers and let the gel mixture bond for a couple months.

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Magnetic particles bind strongly to the cellulose fibers, with a desirable even distribution that gives a high degree of precision in sound reproduction when fashioned into a speaker membrane of about 20cm in diameter.

Whereas a traditional speaker has a voice coil wrapped around a magnet where the induced magnetic field of the coil interacts with the magnet when a current is applied (the mechanical force moves the speaker cone to produce sound waves), the nanoparticle speaker can interact with the voice coil on its own because it is the magnet.

Producing this material doesn't require any complicated machinery — just the patience of a chef waiting for a gel.

Canadian recording artist Romi Mayes let the research team use one of her recordings to demonstrate the world's first magnetic cellulose membrane loudspeakers. **To hear this mp3 sample below in the best possible quality, use your stereo.**

Then you'll hear why magnetic cellulose could soon launch the next "Scandinavian sound..."

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