

Sugars turn supple in solution

Most people don't care whether the white stuff that sweetens coffee holds its shape in solution. But the rigidity of sugars that are part of larger molecules such as glycoproteins may help determine their biological function.

Researchers had thought that sugar stayed stiff, but now two carbohydrate chemists have shown that the bonds between sugar units flex quite rapidly in solution. Leszek Poppe and Herman van Halbeek of the University of Georgia in Athens used nuclear magnetic resonance spectroscopy to gauge the distances between protons in sucrose, a sugar molecule made up of a fructose and a glucose sugar unit. In rigid molecules, these distances stay constant, but in sucrose, different temperatures and magnetic field strengths cause the distances between protons of the two units to change, the researchers report in the Jan. 29 *JOURNAL OF THE AMERICAN CHEMICAL SOCIETY*. Van Halbeek says he envisions molecules with these sugar-to-sugar connections tumbling every few billionths of a second but flexing 10 to 100 times as fast.

Chemistry by computer

Organic chemists keep looking for new ways to achieve reactions. Sometimes they find novel approaches by accident, but two German chemists have found several by computer. Rainer Herges and Christoph Hock of the Erlangen-Nürnberg University in Germany wanted to find a new way to make a diene—a carbon compound containing two double bonds—by rearranging the bonds in a ringed molecule. To make sure they would not overlook any possibilities, they used a computer program to generate and screen all potential pathways.

First the computer found and evaluated the 44 reactions involving four to six atoms, but the five options it identified had been tried before, Herges and Hock report in the Feb. 7 *SCIENCE*. So they had the computer check through the 72 possibilities involving seven atoms and eight electrons.

The computer turned up 26 options, which the scientists narrowed to three reactions they could try in the lab, two of them new to chemistry. With one, they found they could use simple starting materials and get high yields, suggesting that "our fragmentation reaction is probably superior to alternative methods," they say. Herges and Hock think this reaction may prove useful for creating important but hard-to-make dienes, such as those involved in steroid synthesis.

Wiggly gel makes a muscle

Japanese scientists have made a polymer gel that moves in a lifelike way. Yoshihito Osada and his fellow chemists at Ibaraki University first made a gel of negatively charged polymers. They cut out a strip about the size of a matchstick, attached small hooks to it and suspended the gel strip in water. Because of its charged insides, the polymer swelled. The water also contained a surfactant, whose molecules had a positively charged end.

The researchers set up an electric field across the solution, changing its direction every 2 seconds. The polymer bent and straightened with each change, wiggling forward at 10 inches per minute, they report in the Jan. 16 *NATURE*.

The polymer wiggles because alternate sides of the strip lose, and then regain, the ability to absorb water. The electric field causes surfactant molecules to migrate toward one end of the container. As these molecules encounter the polymer, they coat the near side of the strip. The positive charge of the surfactant cancels some of the gel's negative charge, causing that side of the polymer to lose osmotic pressure, purge water and shrink inward. When the scientists reverse the electric field, the surfactant molecules head in the opposite direction; thus, those attached to the polymer leave, while others link up to the other side of the gel, causing that side to shorten. As a result, the polymer straightens.

Letters continued from p.115

the basis for a report on Israeli children or adults. The sample is simply too narrow and specialized.

I would also question the selection of the research population in connection with Lauer's statement that Israelis readily defend themselves physically and often fight over such things as places in line. I have been here some years and have yet to see this. If fighting is done, it is done Samson-style (remember, he slew his Philistines with the jawbone of an ass)—jawing away at 90 decibels and giving off a lot of heat. It doesn't happen with Israelis who are past the immigrant stage, because there is a very tidy etiquette on lines and places in line, and all the locals observe it. If Lauer saw fighting in lines, it is likely that the kibbutz she chose is also a base for immigrant absorption. If so, the presence of these new, unacculturated Israelis in the preschool would also tend to skew her results.

F.J. Bursten
Rehovot, Israel

Reeds as weeds

I enjoyed your article on woodwind reeds ("Good Vibrations," SN: 12/14/91, p.392). Dr. Lawton should be aware, however, that in California, *Arundo donax* has escaped cultivation and is an invasive weed. It can be found displacing native plants, particularly along natural waterways, degrading valuable wildlife

habitat. It is extremely expensive to control and appears impossible to eradicate. Wildlife habitat in California is already under extreme duress, and the introduction of an invasive weed is an additional blow.

I hope Dr. Lawton will pursue her interest in the cultivation of *A. donax* not only with enthusiasm but also with caution.

Marguerite DiGiorgio
Davis, Calif

In defense of Rex

Oidipous Tyrranos may be a better transliteration than Oedipus Rex ("Oedipal objections," Letters, SN: 12/21 & 28/91, p.403), but it is not good usage.

While Oidipous is the proper transliteration from the Greek, the English form—Oedipus—is taken from the Latin spelling. Hence, Oedipus Rex is a perfectly proper and consistent term that has the weight of many years' usage.

Rev. Martin Buote
New Bedford, Mass.

Homosexual evolution

Psychologist J. Michael Bailey states that no good explanation exists for the evolution of genes for homosexuality ("Gene influence tied to sexual orientation," SN: 1/4/92, p.6). I suggest that a family pool that produced some homosexual males, productive but not reproductive, would be more likely to survive hard times than would a family that produced only

reproductive males.

There are two plausible reasons: (a) reduced competition over females with its subsequent conflict leading to loss of useful energy, expulsion of a productive individual or even injury and death; and (b) an optimum number of babies per productive member of the family. The latter would also predict non-reproductive females; however, in earlier societies a female may have been impregnated independent of her sexual orientation.

Sexual orientation should have little, if any, effect on the productivity of an individual if he/she is accepted as a member of the family or tribe. Although the homosexual individual's genes would not be directly transmitted, the family genetic character could be significantly enhanced.

Bernard Baldwin
Bartlesville, Okla.

Bum wrap?

Consumable coatings ("Sealed in Edible Film," SN: 1/4/92, p.12) threaten to present yet another hazard to those of us with food sensitivities and allergies. What may be edible for most can be poison for some; this is especially the case with milk- and grain-derived products. My concern is not so much that products containing such additives are on the market as that they become ubiquitous, making avoidance increasingly difficult.

Elizabeth S. Oscanyan
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