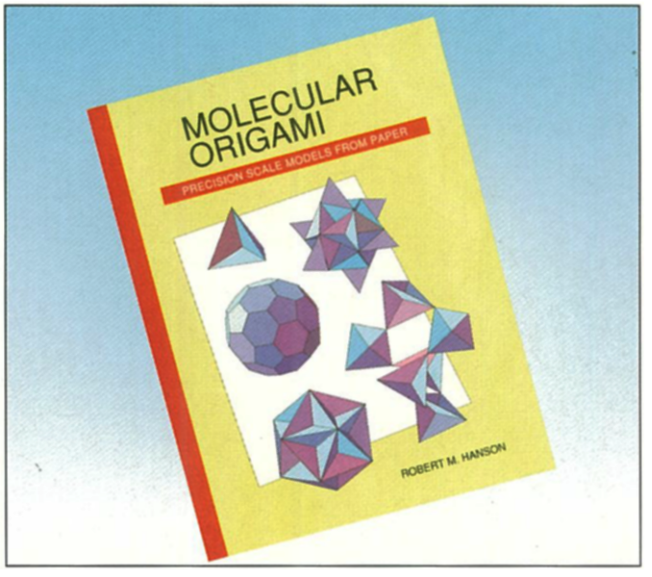
Molecular design — the easy way

Chemistry & Biology February 1996, **3**:95

Molecular Origami: Precision Scale Models from Paper by Robert M Hanson. University Science Books, 1995, 223 pages. $22.00 paper (ISBN 0-935702-30-X).



Origami is the ancient craft in which a simple square of paper is transformed by a series of clever folds and creases into a beautiful three-dimensional object. Anyone who has tried and enjoyed the zen pleasure of conventional origami has probably also discovered its dark side — the maddening frustration of being defeated by a square piece of paper when a would-be giraffe comes out looking more like a sick emu. Not to worry! There is more joy than frustration in working through Robert Hanson's book of exercises in molecular origami. Even the most uncoordinated klutz can assemble some of the simpler folded models, and — believe it or not — a few models (of linear and diatomic molecules) don't require folding! Before running off and buying the book, however, we should tell you that not all of the structures are easy to build; indeed, there are several that will test the skills of the most talented paper folder.

Molecular Origami: Precision Scale Models from Paper combines the better features of model kits and textbooks used in general and inorganic chemistry in a single package. Purists will be put off because the starting point is not a blank square of paper — each of the models is built from a pattern that is cut from the book and held together with the aid of tape. The patterns, however, make it much easier to assemble complex models, and they ensure that the resulting structures are true to scale. A nice bonus is that internuclear distances and angles are shown on the faces of each correctly folded structure.

The textbook-like questions that accompany each model are intended to encourage discussion of the relationships between molecular structure and bonding. A notable strength is that many of the models will be very helpful in teaching symmetry elements in courses on chemical group theory. A minor drawback is that students are limited to models for which there are patterns. In the next edition, Hanson might consider including color-coded models of chiral molecules that would help in the visualization of concepts frequently encountered in organic stereochemistry.

Molecules are beautiful. A lot can be learned by making and examining models of them. At least one student and one teacher recommend *Molecular Origami* to other students and teachers.

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Testing the accuracy, and aerodynamics, of some of the models offered in *Molecular Origami*.