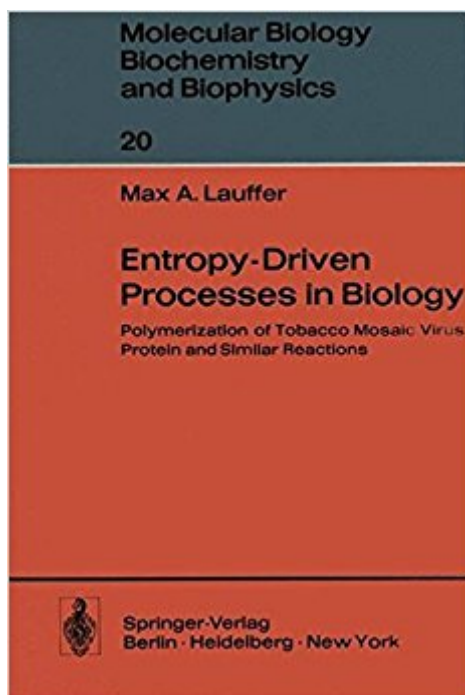


The book was found

Entropy-Driven Processes In Biology: Polymerization Of Tobacco Mosaic Virus Protein And Similar Reactions (Molecular Biology, Biochemistry And Biophysics Molekularbiologie, Biochemie Und Biophysik)



Synopsis

The purpose of this monograph is to bring together under one cover results of research on phenomena drawn from the fields of chemistry, biochemistry, biophysics, virology, and cell biology. The processes and reactions considered have one important feature in common: they are endothermic and, therefore, entropy-driven. They are, in the main, reversible reactions leading to the formation of large structures, some of which play critical roles in life processes. If one thinks only of the subunits and of the structures they form upon polymerization, it seems to be a contradiction that such reactions can be driven by an increase in entropy; entropy is a measure of disorder. The increase in entropy must come from some other source, usually from the release of something coincidental to polymerization. That something has been shown to be water for the case of the polymerization of tobacco mosaic virus protein. Because of the remarkable similarity of the other processes to this one, it is a permissible inference that the release of water is the source of the entropy increase and therefore the driving force for all of them. The reactions and processes brought together in this book are still the subjects of active research. Many of the detailed interpretations presented here must be regarded as tentative, subject to modification as new information becomes available. However, the main characteristic of each reaction or process, its endothermic or entropy-driven nature, is well established in all but one or two instances.

Book Information

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Customer Reviews

I am a Ph.D. student in chemistry studying a self-assembling protein. I don't know why I didn't find this book years ago, I may have overlooked it because of the age of the text and concerns that it was too specialized, but it is exactly what I needed all along: a basic, biophysical description of the nature of self-assembly reactions that are entropically driven (as most are: tobacco mosaic virus, actin, sickle cell anemia, etc). The book is mathematical but not at the expense of conceptual content. Suitable for anyone well grounded in basic thermodynamics and physical chemistry. Tobacco mosaic virus is used as a prototype but the principles and techniques are widely applicable and four of the ten chapters discuss other proteins. With the emerging field of self-assembling nanotubes, books like this merit more attention in the future.

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