

A Friendship over 35 Years

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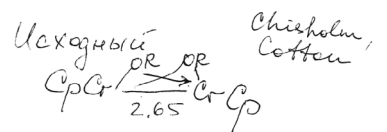
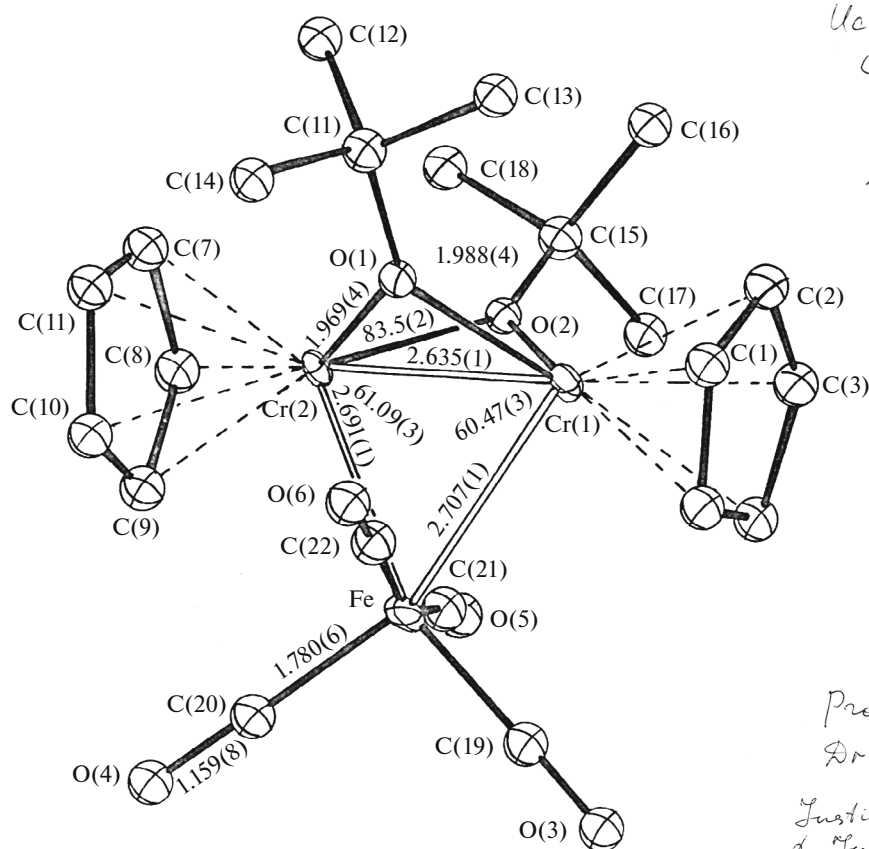
Abstract—This article describes the memoirs and history of correspondence of two outstanding chemists, R. Hoffmann and A.A.Pasynskii. A number of discussions related to isolobal principle and the theory of molecular orbitals were considered.

Keywords: Pasynskii, cluster chemistry, organometallic chemistry, isolobal principle

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The older readers will know the special bond I have had with Russian chemists. It stemmed from a year at MGU (actually in the Physics Faculty) in 1960–1961.

In the years that followed, I came as often as I could to the Soviet Union, and lectured widely. In part this was because I understood from my stay in the USSR how



no
rel(0)5

Chisholm,
Cotton

$$-2\gamma = 246_{\text{cm}^{-1}}$$

$$-2\gamma = 320_{\text{cm}^{-1}}$$

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Fig. 1. The structure of a Cr_2Fe cluster [1] sent in 1984 by A.A. Pasynskii to R. Hoffmann.

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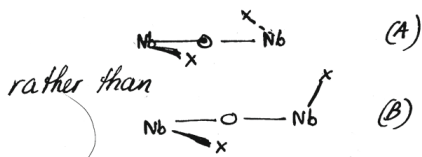
A.A. Pasynskii

Oct. 21, 1985

Dear Aleksander:

It was nice to hear from you, as always. And I'm glad you read my preface to Cotton's book—some day I will have to tell you of my connection to that book.

I've read the papers in detail. On the one on $[\text{Co}'\text{Nb}(\text{CO})_2\text{O}]$ you might have given a little "theoretical" analysis of the conformation, i.e. why it is



It's a problem of 4 orbitals (the two oxygen p type lone pairs and the Nb "1a₁" orbitals) and 6 electrons. With strong similarities to allene, really allene dianion. For 4 electrons

the arrangement (B) would be better



$= \pi^*$

$\pi \pi$



—

$\pi \pi$ πp

"allene" 3 center system

but for 6 electrons A is preferred.

The $(\text{Co}'\text{Nb}(\text{CO})_2\text{SnCl}_2)$ system is most strange. I do not know Sn stereochemistry that well, but I've never seen such a distorted tetrahedron. And it's distorted in a special way, it seems to be by "twisting"



rather than "squashing"

Or by a combination of both, since one angle does open up. I will try to get someone in the group interested in this, but it would be interesting to have a

Fig. 2. Two pages from a 1985 letter from R. Hoffmann to A.A. Pasynskii.

important this window on the world that lectures (and journals) formed for Soviet scientists. In part it was because I found scientists in Russia were more interesting people than scientists in the West. If you are wondering why I would imagine that, think about the choice facing an intelligent 19-year-old in Soviet times as he or she chooses between science and the humanities, between chemistry and philosophy or history, as his life's work. The astute young person would choose science—there he or she would not have to shape their opinions to the party line, and could read roughly the same journals as their colleagues in the West. But the future scientist could hold on to his passions—in music, art, literature—in his or her private world. As a result, he often became a more interesting human being.

Also, as I switched my applied molecular orbital theory from thinking about organic molecules to organometallic and inorganic ones, there arose a special resonance between my theory and the good synthetic and structural work in Russia, especially at the Nesmeyanov Institute of Organoelement Com-

pounds, and the Kurnakov Institute of General and Inorganic Chemistry.

So in 1983 there began a correspondence between me and Aleksandr Anatolyevich, which ended only with his leaving us in 2018. It began with Aleksandr sending to me the structures of the most recent clusters he had made, structures expertly determined by the Struchkov group. Here, poorly reproduced in Fig. 1, is one of the drawings he sent [1].

I sometimes made comments about bonding questions in the cornucopia of compounds his group synthesized [2]. Here (Fig. 2) are the first two pages of a letter I wrote to Aleksandr in 1985.

Note I wrote by hand, as I usually do, and in time Aleksandr Anatolyevich replied similarly. And here (Fig. 3) is the first page from a 1989 letter from him, so you can gauge the warmth of the bond between us.

And almost twenty years later, close to the end of his life, Aleksandr Anatolyevich wrote these verses for an Institute celebration (Fig. 4), connecting us again. I wish I had been there.

2 июня 1989 г.

От профессора
Пасынского АА
Институт общей
и неорганической
химии АН СССР
Москва В-71
Ленинский Пр., 31

Профессору
Рональду Хофформанну
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Дорогой Рональд!

Только сегодня получил Ваш пакет с препринтами статей и был буквально потрясён богатством, заключённым в этом щедром подарке. Статьи по расчётам бидентных комплексов с сульфидными и другими мостиками, о взаимодействии соединений Rh с окислами сразу же используются в нашей работе. Остальные теоретические работы будут очень важны для рассмотрения на семинарах, приёме идеи этих работ удивительно современны и будут стимулировать наши экспериментальные исследования.

Наконец, большое интеллектуальное удовольствие доставляют Ваши статьи по гуманитарным аспектам науки, которые мы не только обсуждаем, но и переводим для публикации в газете нашего Института.

Я сердечно благодарен Вам за внимание, которое очень помогает нам в работе. Надеемся вскоре переслать Вам препринты наших последних статей по синтезу и структуре треугольных гетерометаллических "орнаментов" (этот термин был нами взят из Вашего предисловия к книге F.A. Cotton о кратных связях M-M и подсказав нам идею синтеза).

A. Pasynskii

Fig. 3. First page of a 1989 letter from A.A. Pasynskii to R. Hoffmann.

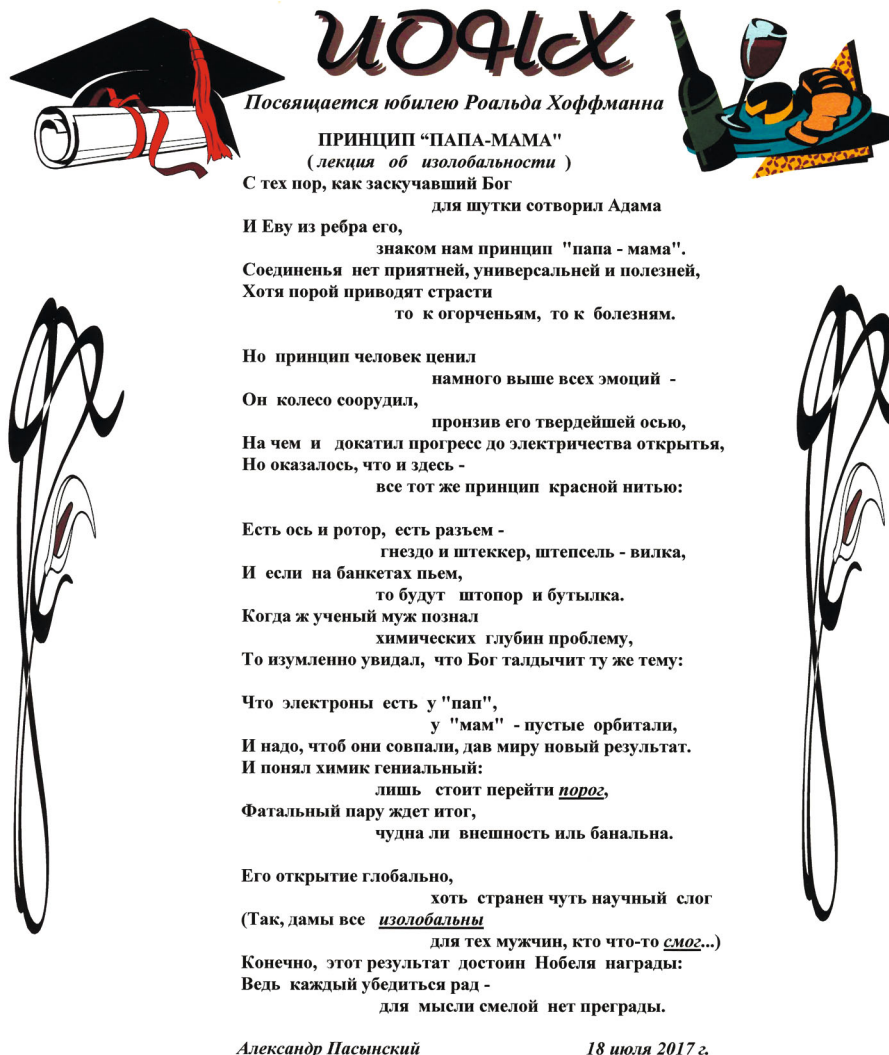


Fig. 4. Some verses by A.A. Pasynskii, for an Institute celebration, dedicated to Roald Hoffmann.

Aleksandr Anatolyevich Pasynskii was a great inorganic and organometallic chemist, with a synthetic "green thumb. He was always asking questions of nature, and trying to understand. No chemical complexity stood in his way. His warmth and sincerity endeared him to me, and to others as well. We remember him.

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