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Kauffman G B & Cowan D O. *Cis-* and *trans*-dichlorodiammine-platinum(II). *Inorganic Syntheses* 7:239-45, 1963.
[Fresno State College, CA]

Cis- and *trans*-dichlorodiammine-platinum(II) played an important role in the historical development of Werner's coordination theory, being the earliest examples proposed for a planar configuration for bipositive platinum. The *cis* isomer is prepared by the action of aqueous ammonia on potassium tetrachloroplatinate(II), and the *trans* isomer is prepared by the action of hydrochloric acid on tetraammineplatinum(II) chloride. [The *SCI*® indicates that this paper has been cited in over 100 publications, making it one of the most-cited papers published in this journal.]

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My lifelong interest in coordination chemistry was aroused during my freshman year (1948) at the University of Pennsylvania by Louis C.W. Baker (now at Georgetown University), a teaching assistant working with the late Thomas P. McCutcheon, who, in 1912, had worked in Zürich with the legendary Alfred Werner (1866-1919). Baker allowed me to work in his private laboratory, and, in gratitude, I dedicated my first book, a study of Werner,[1] to him. I also try to repay my debt to Baker by encouraging my best general chemistry students to carry out research in my laboratory, much of which has resulted in their coauthorship on more than 100 publications (55 student coauthors). My work with students was recognized by my receipt of the 1973 California State University and Colleges Outstanding Professorship and the 1976 Manufacturing Chemists Association Award for Excellence in College Chemistry Teaching. My work on Werner has been recognized by my receipt of the 1978 international Dexter Award in the History of Chemistry.

While at the University of Texas during the mid-1950s, and acting on a suggestion of the late George W. Watt, I began work on the column chromatographic separation of geometrically isomeric coordination compounds on Linde "Molecular Sieves." After my move in 1956 to California State University at Fresno (then Fresno State College) I extended the work to include other adsorbents,[2] and other techniques (thin-layer chromatography),[3] and structural studies[4] under grants from the Research Corporation and the American Chemical Society Petroleum Research Fund. These studies were carried out with a small group of enthusiastic, dedicated students from my General Chemistry, Advanced Inorganic Chemistry, or Independent Study courses (Gary L. Anderson; Dwaine O. Cowan; Louis A. Dee; Robert A. Houghten, Jr.; Edward V. Lindley, Jr.; Robert K. Masters; Robin D. Myers; Louis B. Pankratz; Robert P. Pinnell; Nobuyuki Sugisaka; Larry A. Teter; Lloyd T. Takahashi; and James Hwasan Tsai), some of whom were my age or older.

Although adsorption chromatography had been used to separate a variety of isomeric organic substances, the technique had been applied to only a limited number of inorganic isomers. Since ideal isomer pairs for separation should be inert so as to minimize isomerization, we began our separations using coordination compounds of the platinum group metals, especially platinum, iridium, rhodium, and palladium. In the course of our work we developed reproducible syntheses for more than two dozen such compounds, resulting in no less than 15 articles published in *Inorganic Syntheses* during the period 1960-1966. Since much of the pioneering work on the platinum metals was carried out by Russian chemists, I directed my historical interests to a series of studies of these men, which continues to this day. For these works the USSR Academy of Sciences awarded me in 1978 its L.A. Chugaev Memorial Diploma and Bronze Medal.[5]

Our synthesis of *cis-* and *trans*-dichlorodiammineplatinum(II) ($[PtCl_2(NH_3)_2]$) undoubtedly owes its frequent citation in the literature to the fact that the *cis* isomer ("cisplatin") has found increasingly important use in the treatment of cancer. Since the pioneering work of Barnett Rosenberg and colleagues,[6] literally hundreds of investigations in laboratories and medical institutions around the world have involved this compound, which, ironically, we found to be unsuitable in developing our separation method because of its limited solubility in nonpolar solvents. Nevertheless, it introduced me and a number of my students to a fascinating field of research.

[For more recent work in this field, see reference 7.]

1. **Kauffman G B.** *Alfred Werner: founder of coordination chemistry.* Berlin: Springer-Verlag, 1966. 127 p.
2. **Kauffman G B, Pinnell R P & Takahashi L T.** The separation of inorganic stereoisomers by adsorption chromatography: I. Nonelectrolytic geometric isomers of platinum(II). *Inorg. Chem.* 1:544-50, 1962.
3. **Kauffman G B & Benson B W.** The separation of nonelectrolytic geometric isomers of platinum(II) by thin-layer chromatography. *Inorg. Chem.* 6:411-3, 1967.
4. **Kauffman G B, Tsai J H & Jørgensen C K.** The configurations of yellow and red trichlorotris-(diethyl sulfide)-iridium(III). *Inorg. Chem.* 2:1233-8, 1963.
5. **Kauffman G B.** Terpenes to platinum: the chemical career of Lev Aleksandrovich Chugaev. *J. Chem. Educ.* 40:656-65, 1963.
6. **Rosenberg B, Van Camp L & Krigas T.** Inhibition of cell division in *Escherichia coli* by electrolysis products from a platinum electrode. *Nature* 205:698-9, 1965. (Cited 330 times.)
7. **Peerey L M & Kostic N M.** Transition-metal compounds as new reagents for selective cross-linking of proteins. Synthesis and characterization of two bis(cytochrome-c) complexes of platinum. *Inorg. Chem.* 26:2079-83, 1987.