

## Professor Henk C. van der Plas

### A Tribute



Henk van der Plas was born on the 4<sup>th</sup> of May 1929 at Voorhout (the Netherlands). He grew up in the city of Haarlem (the Netherlands) together with a family of five brothers and one sister. After his primary education he went to the Augustiner grammar school, where he finished in 1947. He wanted to get a degree at the Royal Military Academy, but due to his young age he had to wait two years before he was allowed to start his studies there. To bridge that period of two years he worked in a chemical laboratory as a technician. Due to serious ear trouble he finally was denied enrolment in the Royal Military Academy. He then decided to matriculate at the University of Amsterdam (UvA) for a degree in chemistry and obtained his Masters Degree in 1956. His majors were organic chemistry and crystallography. For his PhD he moved to the organic chemistry laboratory of the University of Wageningen (UvW) where he worked under the guidance of Prof. H.J. den Hertog, a specialist in heterocyclic chemistry. He was awarded his PhD in 1960 for a thesis entitled *Sulfonation of pyridine and pyridine derivatives, in which the nitrogen is masked by the presence of voluminous alkyl groups*. He then went with his family for a two-year postdoctoral appointment in the USA, where he worked with Prof. R.H. Wiley in Louisville (Kentucky) on the NMR spectroscopy of hexatrienoic acids. His great interest in heterocyclic chemistry brought him back to Wageningen where he was appointed as Associate Professor. In 1970 he became full professor of organic chemistry at Wageningen. His research on important topics in heterocyclic chemistry, such as hetaryne chemistry, tele and cine nucleophilic substitutions, hetero ring transformations, photochemistry of hetarenes, use of enzymes in synthetic heterocyclic chemistry and synthesis of bioheterocycles. He was the discoverer of the so-called  $S_N(\text{ANRORC})$  mechanism for nucleophilic substitution. Using  $^{15}\text{N}$ -

labelling techniques, combined with  $^1\text{H}$ - and  $^{13}\text{C}$ -NMR spectroscopy, he proved that many amide- and amino-dehalogenations in di-, tri- and tetra-azines occur by *Addition of the Nucleophile, Ring Opening and Ring Closure*. Moreover his research group discovered that many  $\sigma$ -amino dihydroadducts of polyazines, formed in liquid ammonia systems, could be easily converted into amino azaheteroaromatics using the oxidant potassium permanganate ( $\text{S}_{\text{N}}\text{H}$  substitution). This method provided a facile and excellent entry to the synthesis of aminoazaheteroaromatics which could not, or only with great difficulty, be prepared in a classical way. The results of his work have been published in about 400 research papers and 20 review articles. Furthermore he wrote two monographs on *Ring Transformations of Heterocycles* and one on *Degenerate Ring Transformations*. Together with the Russian scientists Prof. Chupakhin and Prof. Charushin he also wrote the first book on *Nucleophilic Aromatic Substitution of Hydrogen*. In addition, he co-edited several books on bioheterocyclic chemistry.

Prof. van der Plas was an invited plenary speaker at many international conferences and symposia. He lectured on more than 70 international conferences. He gave courses at postdoctoral level in Puerto Rico, Egypt, Belgium, Japan, France, Switzerland and Hungary. The university elected him as Rector Magnificus for the period 1977-1981 and re-elected him seven years later, from 1988-1993. He retired from Wageningen University in 1995. He received numerous awards for his contributions to fundamental research work in heterocyclic chemistry. He was the first chemist to be honoured with the international award in heterocyclic chemistry, given by the International Society of Heterocyclic Chemistry (1981). He received six Honorary Doctorate degrees from different universities in Europe (Wroclaw (1987), Leuven (1989), Prague (1993), Krakow (1995), Göddöllö(1995)) and the Agricultural Academy Moscow (1996). He was elected as Foreign Member of the Russian Academy of Sciences (1993) and nominated as Honorary Member of the Polish Chemical Society (1990), the Hungarian Chemical Society (2000), the International Society of Heterocyclic Chemistry (2001) and the Hungarian Academy of Sciences (2004). He received the Hiller Award from the Institute of Organic chemistry in Riga (1991), the Gold Medal of Interbioscreen in Moscow (2003) and the Kost Award (2006).

Besides being an active researcher he devoted time to serve the chemical society and the society at large. He was President of the Royal Netherlands Chemical Society, President of the International Society of Heterocyclic Chemistry, President of the Netherlands University Foundation for International Cooperation (NUFFIC), President of the Federation of European Chemical Societies (FECHEM), President of the Board of the Institute of Social Studies and President of the Board of the Catholic Organisation for Development Aid (CORDAID). He was the founder and, for more than 20 years chairman, of the successful series of the FECHEM conferences on the *Role of Heterocycles in BioOrganic Chemistry* and for many years an active member of the scientific committees of the European Colloquium on Heterocyclic Chemistry (ECHC) and the International Symposium on the Chemistry and Pharmacology of Pyridazines (ISCPP).

Because of his devotion to the development of science and his active role in the society he received high distinctions. The Queen of the Netherlands, her Majesty Queen Beatrix, bestowed

on him the knighthood in the Order of the Dutch Lion (1988) and nominated him to Commandeur in the Order of Oranje Nassau (1993). For his long standing active role in the organisation for development aid, the Vatican nominated him to Commandeur in the Order of the Holy Gregorius the Great.

Throughout his life he loved to pursue sport, football and tennis being his favourites. As a young boy he was a member of the famous cathedral choir at the city of Haarlem. During his active working period there was hardly time to practice singing and attending regular choir rehearsals. Now, there is more time for his hobbies. Five years ago he joined a choir which specialises in Gregorian music so now the circle is complete. He started as a boy of 7 to sing in a choir and now being in the age of 80 he again sings in a choir, enjoying the beautiful Gregorian music. Let us hope for a long time!

It is an honor to act as a facilitator for the commemorative issue of such a giant in heterocyclic chemistry and to acknowledge not only his science but his warm personality.

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#### List of representative publications:

1. van der Plas, H. C. The  $S_N$ (ANRORC) mechanism: a new mechanism for nucleophilic substitution, *Accounts Chem. Res.* **1978**, *11*, 462.
2. Hara, H.; van der Plas, H. C. A new procedure for the introduction of an amino group in azaheterocycles. *J. Heterocyclic Chem.* **1982**, *19*, 1285.
3. van der Plas, H. C. Ring degenerate ring transformation of azines. *Tetrahedron* **1985**, *41*, 237.
4. Chupakhin, O. N.; Charushin, V. N.; van der Plas, H. C. Nucleophilic substitution of hydrogen in azines. *Tetrahedron* **1988**, *44*, 1.
5. Marcelis, A. T. M.; van der Plas, H. C. Diels-Alder reactions of diazines and pyridines. *Trends Heterocycl. Chem.* **1991**, *1*, 112.
6. van de Plas, H. C. Thirty years of pyrimidine chemistry in the University of Wageningen. *Khim. Geterotsiklicheskikh Soedin.* **1995**, 1649.
7. Wozniak, M.; van der Plas, H. C. Chemistry of nitronaphthyridines. *Adv. Heterocycl. Chem.* **2000**, *77*, 285.
8. van der Plas, H. C. Degenerate ring transformations in heterocyclic systems (review). *J. Heterocyclic Chem.* **2000**, *37*, 427.
9. van der Plas, H. C. Pyrimidine-pyridine ring interconversion (review). *Adv. Heterocycl. Chem.* **2003**, *84*, 31.
10. van der Plas, H. C. Oxidative amino-dehydrogenation of azines (review). *Adv. Heterocycl. Chem.* **2003**, *86*, 2.