

KÁROLY TETTAMANTI

(1912—1983)

Professor Tettamanti was one of the pioneers of chemical unit operations research and education in Hungary. A qualified chemical engineer, C. Sc., honorary doctor of the Leningrade Institute of Technology, he was professor and head of the Department of Chemical Unit Operations at the Budapest Technical University till his retirement in 1977. He deceased after a long, serious illness on June 3, 1983.

Károly Albin Tettamanti was born in Makó, on December 3, 1912 from an intellectual family. His father, Béla Tettamanti taught at a secondary school and was the professor of Attila József, one of the most renown Hungarian poets.

Professor Tettamanti originally intended to become an organic chemist. Already in the year before his graduation at the Technical University Budapest in 1935, he worked at the Department of Organic Chemistry with Professor Géza Zemplén. He participated in launching the production of Salvarsan in Hungary and in research work on glycoside. He took his degree as chemical engineer at the Technical University in 1936 and became senior assistant of Géza Zemplén in 1938.

His industrial career began in 1939. First he became chief engineer and then technological director of the Alkaloida Chemical Factory in Tiszavasvár. On basis of a Hungarian patent the factory produced morphia and other alkaloids from poppy-head with a rather inferior output. It was then that Károly Tettamanti started to work on the theory of solid-liquid extraction and to study the operation of chemical industry installations. Based on unpublished research results and by reorganizing the plant he succeeded to increase alkaloids production twofold and the production of the factory by three times.

Due to an industrial accident in 1942, he broke both legs and was often bedridden for the following 8 years.

Because of his leftist political activity the government of that time dismissed him from his job; he was forced to go into hiding with his family, with false papers. After the liberation of the country, commissioned by the provisional government in Debrecen, he restarted production at the Alkaloida

Chemical Factory. From 1946 he was entrusted by the Reparations Office to undertake factory planning work.

From 1949 till 1952 Professor Tettamanti was assistant director of the Central Biochemical Laboratory; here he was mainly occupied with technological, industrial questions.

Professor Tettamanti took part in research and development of Hungarian penicillin production. He controlled research work intended to produce corn steep liquor, the culture-medium of penicillin; on bases of the method developed, up to date, counter current steeping was introduced for attacking corn at the Ászár starch factory and a corn starch and corn steep liquor plant was established at Pécs. He planned and put into operation the first fermentors in Hungary, succeeded in solving their aseptic aeration, participated in the design work of fermentors at the penicillin factory in Debrecen. He also controlled pilot plant experiments in different fermentation technologies, as, for instance, streptomycin and sorbose production.

Between 1952 and 1961 he was director of the Organic Chemistry Research Institute and from 1955 till 1960 also of the Plast Research Institute that had been provisionally amalgamated with the former. Here, as usual, Professor Tettamanti mainly controlled pilot experiments, plant design and launching operations. Together with his co-workers he developed the technology of furane as well as of caprolactame production (evaporation in rotating swing blade film evaporator; multi-stage countercurrent liquid-liquid extraction in mixer-settler equipment.) Also together with his co-workers he developed a patented procedure and instrument named Liquofix for the extraction of mixtures separated with difficulty. With the method and instrument also extraction in several hundred steps can be realized as applied, for instance, in the pharmaceutical industry for producing digital glycosides.

He undertook efforts to launch the technical utilization of synthetics (e. g. synthetic pumps, synthetic gears) in Hungary. Together with his co-workers he elaborated a space filling molecular model, patented under the name "Eugon", used in research practice and in teaching chemistry.

From 1955 till 1961 he was part time, and from 1961 till 1977 full time professor and head of the Department of Chemical Unit Operations of the Chemical Engineering Faculty at the Technical University Budapest. The Department was organized as such in 1952, but he acted as invited lecturer already during the 1950/51 academical year. As head of department he organized the pilot teaching of Chemical Unit Operations: planned and brought into being the pilot laboratories, organized practical work. Through his highly interesting lectures he educated his students to love their vocation. In discussions in the laboratory he formed them to be full value humans through his own humane attitude, his intellect, his political prowess.

Professor Tettamanti's life-work was honoured by our government with the Kossuth-prize, the Fifth Grade of the People's Republic Decoration, the Medal for Socialist Work and three times with the Gold Grade of the Decoration for Work.

Hajnalka HAJDÚ

Scientific Work of Prof. Tettamanti

Publications

1. G. ZEMPLÉN—K. TETTAMANTI: Über die Biose des Hesperidins und des Neohesperidins. *Berichte der Deutschen Chemischen Ges.* 71, 2511—2520 (1938)
2. K. TETTAMANTI: Mezőgazdasági termékek, mint a vegyi ipar nyersanyagai. (Agricultural products as raw materials of chemical industry) *MTA Vegyészcsop. Közl.* 1—8 (1950)
3. P. MEDGYESSY—A. RÉNYI—K. TETTAMANTI—I. VINCZE: A kémiai frakcionáló megosztás matematikai tárgyalása nem teljes diffúzió esetében. (Mathematical treatment of chemical fractional distribution) *MTA Alk. Mat. Int. Közl.* III. köt. 81—97 (1954)
4. L. G. BEREGI—F. KÁLLAY—K. TETTAMANTI: Recherches récentes dans le domaine de la chimie du furane en Hongrie. *Chimie et Ind.* 78, 347—350 (1957)
5. K. TETTAMANTI—A. USKERT: Extraction methods Using an Immobilized Phase Part. I. Immobilization of the Aqueous Phase with Regenerated Cellulose. *Acta Chim. Acad. Sci. Hung.* Tom. 16. Fasc. 4. 379—388 (1958)
6. K. TETTAMANTI—A. USKERT: Extraction Methods Using an Immobilized Phase Part. II. A 200-step Countercurrent Distribution Apparatus with an Immobilized Aqueous Phase. *Acta Chim. Acad. Sci. Hung.* Tom. 17. Fasc. 3. 353—368 (1958)
7. F. KÁLLAY—K. TETTAMANTI: A tetrahydrofuranból történő 1,4-diklórbutánképződés részletreakciói piridin-hidroklorid jelenlétében. (Formation of 1,4 dichlor butane from tetrahydrofuran) *A Szerves Vegyipari Kutató Int. Tíz éves munkája* 20—30 (1949—1959)
8. K. TETTAMANTI—M. NÓGRÁDI—J. SAWINSKY: Equilibria of the ternary system caprolactam (water) organic solvent in the liquid state. *Period. Polytech. Chem. Eng.* 4, 201—218 (1960)
9. K. TETTAMANTI—A. USKERT: Craig-Verfahren mit immobilier wässriger Phase. *Chem. Ing. Technik* 32, 691—694 (1960)
10. K. TETTAMANTI—M. NÓGRÁDI: The influence of ammonium sulphate on the distribution of caprolactam in the water/trichloro-ethylene system. *Period. Polytech. Chem. Eng.* 5, 15—23 (1961)
11. K. TETTAMANTI: Termodinamikus jelenségek kinetikus magyarázata. (Kinetical study of thermodynamical phenomena) *Fizikai Szemle* 1—3 (1962)
12. K. TETTAMANTI—J. SAWINSKY: Keverő-ülepítő extraktor alkalmazása a kaprolaktámgyártásban. (Use of mixing-settling extractors in the production of caprolactam) *BME Évkönyv.* 265—273 (1962)
13. K. TETTAMANTI: A kinetic explanation of adiabatic compression. *Period. Polytech. Chem. Eng.* 6, 139—148 (1962)
14. K. TETTAMANTI—J. SAWINSKY: The time required for the attainment of 99 percent of the stationary state in a counter-current extractor. *Proceedings of the conference on some aspects of Phys. Chem.* 97—106 (1966)

15. J. MANCZINGER—K. TETTAMANTI: Phase equilibria of the system caprolactam/water (A novel apparatus for the study of vapour/liquid equilibria). *Period. Politech. Chem. Eng.* *10*, 183—195 (1966)
16. K. TETTAMANTI—A. BORUS—J. KREPUSKA: The Boiling-point function of n-paraffin Hydrocarbons. *Acta Chim. Acad. Sci. Hung. Tom.* *50*, 145—153 (1966)
17. K. TETTAMANTI—J. MANCZINGER—R. STOMFAI: Szerves vegyületek tenzió-forrpont adatainak matematikai feldolgozása. (Mathematical modelling of boiling point datas of organic compounds) *BME Tud. Ülésszak* 76—89 (1967)
18. K. TETTAMANTI—A. USKERT—J. SAWINSKY: Folyadék—folyadék extrakciós eljárások I. (Liquid—liquid extraction operations I.) *Magyar Kém. Lapja* 140—151 (1968)
19. K. TETTAMANTI—A. USKERT—J. SAWINSKY: Folyadék—folyadék extrakciós eljárások II. (Liquid—liquid extraction operations II.) *Magyar Kém. Lapja* 213—220 (1968)
20. K. TETTAMANTI—J. TÖRÖK: Spatial models of molecules in chemical research and tuition. *Period. Polytech. Chem. Eng.* *12*, 43—57 (1968)
21. K. TETTAMANTI—J. TÖRÖK: Spatial models of molecules in chemical research and in tuition. II. *Period. Polytech. Chem. Eng.* *12*, 181—205 (1968)
22. K. TETTAMANTI—J. TÖRÖK: Spatial models of molecules in chemical research and tuition III. *Period. Polytech. Chem. Eng.* *12*, 401—418 (1969)
23. K. TETTAMANTI—J. SAWINSKY: Berechnung der Anlaufzeit eines Gegenstromextraktors *Chem. Technik.* *20*, 338—341 (1968)
24. K. TETTAMANTI—E. BÉKÁSSY—MOLNÁR: Letters to the editor (G. Narsimhan) *British Chem. Eng.* *13*, 549 (1968)
25. K. TETTAMANTI—G. HAVAS—J. SAWINSKY: Froude number, and power consumption of mixing I. *Acta Chim. Sci. Hung. Tom.* *60*, 191—204 (1969)
26. J. MANCZINGER—GY. RADNAI—K. TETTAMANTI: Vapour—liquid equilibrium of the system ethanol/dioxane. *Period. Polytech. Chem. Eng.* *13*, 189—205 (1969)
27. K. TETTAMANTI—J. SAWINSKY—J. MANCZINGER—J. HUNEK—G. HAVAS: Új extrakciós eljárás ipari szennyvizek fenolmentesítésére. (New method for extracting phenol in sewage) *Magyar Kém. Lapja* 502—506 (1970)
28. K. TETTAMANTI—GY. SÁRKÁNY—D. KRÁLIK—R. STOMFAI: Über die Annäherung logarithmischer Funktionen durch algebraische Funktionen. *Period. Polytech. Chem. Eng.* *14*, 99—111 (1970)
29. GY. SÁRKÁNY—P. RÓZSA—K. TETTAMANTI: The analytical calculation of the number of theoretical plates. *Period. Polytech. Chem. Eng.* *14*, 321—331 (1970)
30. H. HAJDÚ—K. TETTAMANTI: Prediction of heat transfer coefficients in vertical tube evaporators. *Proc. 2nd Conf. Appl. Phys. Chem.* *2*, 17—29 (1971)
31. K. TETTAMANTI—J. MANCZINGER—J. HUNEK: Calculation of continuous and batchwise countercurrent solid-liquid, extraction. *Proc. 2nd. Conf. Appl. Phys. Chem.* *2*, 397—411 (1971)
32. K. TETTAMANTI: Department of Chemical Unit Operations. Hundred Years of the Fac. *Chem. Eng. Techn. Univ. Bp.* 199—206 (1972)
33. L. SZEKERES—K. TETTAMANTI: Some New Data Regarding the Formation of Alkylglycosides. *Microchem. Journal* *17*, 148—150 (1972)
34. K. TETTAMANTI—G. HAVAS—J. SAWINSKY: Froude Number and power consumption of mixing II. *Acta Chim. Acad. Sci. Hung.* *71*, 445—464 (1972)
35. K. TETTAMANTI—H. HAJDÚ: Heat transfer in vertical tube evaporators I. *Period. Polytech. Chem. Eng.* *16*, 347—365 (1972)
36. H. HAJDÚ—K. TETTAMANTI: Heat transfer in vertical tube evaporators II. *Period. Polytechn. Chem. Eng.* *17*, 321—333 (1973)

37. K. TETTAMANTI—R. STOMFAI: Über ein Funktionenfolgen-tripel für die geeignete Beschreibung verschiedener physikalischer Vorgänge. *Period. Polytechn. Chem. Eng.* *17*, 139—164 (1973)
38. K. TETTAMANTI—J. SAWINSKY: Megjegyzés a Darcy—Carman egyenlet használatához. (Remarks to the use of the Darcy—Carman equation) *Magyar Kém. Lapja* *28*, 369—370 (1973)
39. K. TETTAMANTI—G. HAVAS—J. SAWINSKY: Froude number and power consumption of mixing III. *Acta Chim. Acad. Sci. Hung.* *80*, 469—487 (1974)
40. K. TETTAMANTI—G. HAVAS: Les questions techniques de l'extracteur dit mélangeur-décanteur — L'homogénéité et l'efficacité du mélangeage. *Period. Polytechn. Chem. Eng.* *18*, 73—89 (1974)
41. K. TETTAMANTI—J. MANCZINGER—J. HUNEK—R. STOMFAI: Calculation of countercurrent solid-liquid extraction. *Acta Chim. Acad. Sci. Hung.* *85*, 27—45 (1975)
42. E. BÉKÁSSY-MOLNÁR—P. FÖLDES—K. TETTAMANTI—K. K. HUNEK: Joint optimization of the construction and operation at various pressures of plate distillation columns Part II. Discussion and generalization of results. *Period. Polytechn. Chem. Eng.* *19*, 227—239 (1975)
43. J. LUKÁCS—S. KEMÉNY—J. MANCZINGER—K. TETTAMANTI: Importance of the real behavior of the vapor phase for the evaluation of vapor-liquid equilibrium data. *Period. Polytechn. Chem. Eng.* *20*, 47—67 (1976)
44. K. TETTAMANTI—J. TÖRÖK: Concentration dependence of diffusion coefficient in vapor-gas systems and the mechanism of vaporisation. *Acta Chim. Acad. Sci. Hung.* *91*, 217—224 (1976)
45. K. TETTAMANTI—R. STOMFAI—S. KEMÉNY—J. MANCZINGER: Remarks on the application of weighted regression. *Period. Polytechn. Chem. Eng.* *21*, 333—342 (1977)

Patents

1. B. SÁNDOR—K. TETTAMANTI—A. USKERT: Kivonatoló berendezés nem elegyedő oldószerpárokkal történő frakcionáló megoldás foganatosítására (Extractor for fractioning with non-mixable solvents) Hung. Pat. 143.694 Ri-162. 1955
2. K. TETTAMANTI—F. KÁLLAY: Eljárás 1,4-dihalogénszénhidrogének előállítására (Method for producing 1,4-dihalogene-hydrocarbons) Hung. Pat. 144.606. 1956
3. K. TETTAMANTI—S. NAGY: Korrozóálló szivattyú folyékony, vagy légnemű anyag folyamatos adagolására (Corrosion resisting pump) Hung. Pat. 148.537. OTH 2251/SE-961. 1959
4. K. TETTAMANTI—M. NÓGRÁDI: Eljárás kaprolaktám előállítására vizes oldatából ellenáramú kivonatolás útján (Countercurrent extraction for preparation of caprolactam from aqueous solution) Hung. Pat. 149.164. 1959
5. K. TETTAMANTI—A. USKERT—S. NAGY: Eljárás és készülék nem elegyedő folyadékok hatékony összekeverésére és szétválasztására főleg kivonatoló műveletek megvalósítása céljából (Method and apparatus for mixing and separation of non-mixable liquids) Hung. Pat. 150.408. 1961
6. K. TETTAMANTI—A. MESSMER—B. ZINCZ—B. IVÁNYI—I. MÁTÉ: Szöghüségét biztosító atomkalott-modell (Conformal space filling molecular model) Hung. Pat. 151.613. 1962
7. K. TETTAMANTI—E. MIGRAY—S. NAGY—J. SAWINSKY: Eljárás és berendezés folyadékok folyadékkal, többfokozatú keverő-ülepítő rendszerben való extrahálására (Method and apparatus for extraction of liquid—liquid systems in multi-step mixing-settling system) Hung. Pat. 151.614. 1962
8. K. TETTAMANTI—J. MANCZINGER—J. TÖRÖK—A. USKERT: Eljárás cellulóz xantogénatból készült szivacsos test térfogatának csökkentésére (Method for decrease of xantogenate porous bodies) Hung. Pat. 153.568. 1965