

- Acebal, S.G. (1989). *Comportamiento de algunos agentes complejantes carboxílicos como extractantes de elementos menores en suelos*. Tesis Doctoral. Universidad Nacional del Sur. Bahía Blanca, Argentina.
- Acebal, S.G., Grassi, R.L. y B.M. Vuano (1993). *Influencias estructurales de complejantes fosfónicos en la extracción de metales en suelos arenosos*. Anales de la Asociación Química Argentina, 81:57-65.
- Acebal, S.G., Mijovilovich, A., Rueda E.H., Aguirre M.E. and C. Saragovi (2000). *Iron-oxide mineralogy of a Mollisol from Argentina: a study by selective dissolution techniques, X-Ray diffraction and Mössbauer Spectroscopy*. Clays and Clay Minerals, 48(3):322-330.
- Agazzi, A. and C. Pirola (2000). *Fundamentals Methods and Future Trends of Environmental Microwave Sample Preparation*. Microchemical Journal, 67:337-341.
- Alloway, B.J. (1993). *Heavy metals in soils*. John Wiley & Sons Inc. New York. 340 pp.
- Álvarez Fernández, A., García Marco S. and J. Lucena (2000). *Evaluation of synthetic iron (III) chelates (EDDHA/Fe, EDDHMA/ Fe and the novel EDDHSA/Fe) to correct iron chlorosis*. Eur. J. Agr., 222(2):119-130.
- Alvarez, M. B. (2006). *Distribución y especiación de metales en sedimentos marino-costeros*. Tesis Doctoral. Universidad Nacional del Sur. Bahía Blanca. Argentina.
- Aubert, H. and M. Pinta (1977). *Trace Elements in Soils*. Elsevier Scientific Publishing Company Amsterdam. New York.
- Bacon, J.R., Hewitt, I.J. and P. Cooper (2005). *Reproducibility of the BCR sequential Extraction Procedure in a Long-term Study of the Association of Heavy Metals with Soil Components in an Upland Catchment I Scotland*. The Science of the Total Environment, 337:191-205.
- Baker, H. and F. Khalili (2005). *A study of complexation thermodynamic of humic acid with cadmium(II) and zinc(II) by Schubert's ion-exchange method*. Anal. Chim. Acta, 542:240-248.
- Becke, A.D. (1993). *Density-functional thermochemistry. The role of exact exchange*. J. Chem. Phys., 98:5648-5652.
- Besoain, E. (1985). *Mineralogía de arcillas de suelos*. Publicado por el Centro Interamericano de Documentación e Información Agrícola (CIDIA), San José, Costa Rica, 1205 pp.
- Bibak, A., Behrens, A., Stürup S., Knudsen L. and V. Gundersen (1998). *Concentrations of 63 Major and Trace Elements in Danish Agricultural Crops Measured by Inductively Coupled Plasma Mass Spectrometry. 1. Onion (Allium cepa Hysam)*. J. Agric. Food Chem., 46:3139-3145.
- Bohn, H., McNeal, B. and G. O'Connor (1993). *Química del Suelo*. Editorial Limusa. México. 370pp.
- Bordas, F. and A. Bourg (1998). *Effect of Complexing agents (EDTA and ATMP) on the remobilization of heavy metals from a polluted river sediment*. Aquatic Geochem., 4:201-214
- Bouhsina, S., Buglyó, P., Abi Aad, E., Aboukais, A. and T. Kiss (2004). *Formation of oligonuclear complexes between copper(II) and 1-hydroxyethane-1,1diphosphonic acid*. Inorg. Chim. Acta, 357:305-310.
- Bower, C.A., Reitemeier, R. F. and M. Fireman (1952). *Exchangeable cation analysis of saline and alkali soils*. Soil Sci., 73:251-253.
- Brown, T., LeMay, H.E., Bursten, B. and J. Burdge (2004). *Química. La Ciencia Central*. 9<sup>th</sup> ed. Pearson Ed.

- Brunauer, S., Emmett, P.H. and E. Teller (1938). *Adsorption of gases in multimolecular layers*. J. Am. Chem. Soc., 60:309-319.
- Bucheli-Witschel M. and T. Egli (2001). *Environmental fate and microbial degradation of aminopolycarboxilic acids*. FEMS Microbiol. Rev., 25:69-106.
- Buffa, E.V. y S.E. Ratto (2002). *Extracción simultánea de cobre, zinc, hierro y manganeso en suelos de la Pampa Loéssica Alta de Córdoba. Argentina*. Agrochimica, XLVI (5-6):241-252.
- Buffa, E.V. y S.E. Ratto (2005a). *Disponibilidad de cinc, cobre, hierro y manganeso extraíble con DTPA en suelos de Córdoba, (Argentina) y variables edáficas que la condicionan*. Ciencia de suelo, 23(2):107-114.
- Buffa, E.V. y S.E. Ratto (2005b). *Fraccionamiento de cobre y cinc en suelos loéssicos de Córdoba, (Argentina) afectados por anegamiento*. Actas Primera Jornada Nacional de Micronutrientes. UNLP. La Plata. Argentina.
- Bussetti, S.G. de y E. Ferreiro (2006). *Áreas superficiales de minerales, arcillas y suelos a partir de monocapas adsorbidas*. Actas del XX Congreso Argentino de la Ciencia del Suelo. Salta. Argentina.
- Cappannini, D. y R. Lores (1966). *Los Suelos del Valle Inferior del Río Colorado*. INTA. Buenos Aires.
- Carey, F. (2006). *Química Orgánica*. 6º ed. Mc Graw Hill. 1245 pp.
- Carroll, R.L. and R.R. Iranil (1967). *On the acidity of substituted methylenediphosphonates and their interaction with Alkali Metal Ions*. Inorg. Chem., 6:1994-1998.
- Carter, D.L., Heilman, M. D. and C.L. Gonzalez (1965). *Ethylene glycol monoethyl ether for determining surface area of silicate mineral*. Soil Sci., 100:356-360.
- Chao, T.T. (1984). *Use of Partial Dissolution Techniques in Geochemical Exploration*. J. Geochem. Explor., 20:101-135.
- Cheng, K.L. and R.H. Bray (1953). *Two specific methods of determining copper in soils and in plant material*. Anal. Chem., 25:655-660.
- Davidson, C. M., Thomas, R. P., McVey, S. E., Perala, R., Littlejohn, D. and A. Ure (1994). *Evaluation of a Sequential Extraction Procedure for the Speciation of Heavy Metals in Sediments*. Anal. Chim. Acta, 363(1):45-55.
- Davidson, C. M.; Duncan L.A.; Littlejohn, D., Ure, A. and L.M. Garden (1998). *A critical evaluation of the three stage BCR sequential extraction procedure to assess the potential mobility and toxicity of heavy metals in industrially contaminated land*. Anal. Chim. Acta, 363(1):45-55.
- Davidson, C. M., Hursthouse, A.S., Tognarelli, D.M., Ure, A. M. and G.J. Urquhart (2004). *Should acid ammonium oxalate replace hydroxylammonium chloride in step 2 of the revised BCR sequential extraction protocol?* Anal. Chim. Acta, 508:193-199.
- Davies, B.E. and L.H.P. Jones (1992). *Micronutrientes y elementos tóxicos. De Condiciones del suelo y desarrollo de las plantas según Russell*. Edic. Mundi-Prensa. Madrid. 1045 pp.
- Day, P.R. (1965). *Methods of soil analysis*. Part I. Agronomy, 9:545–567. Black et al. (Ed.).
- de Klerk, J.M, van Dijk, A., van Het Schip, A.D., Zonnenberg, B.A. and P.P. van Rijk (1992). *Pharmacokinetics of rhenium-186 after administration of rhenium-186-HEDP to patients with bone metastases*. J. Nucl. Med., 1992(33):646-651.

- De Wit, A.M.W. and L.C. Brouwer (1996). *The effect of afforestation as a restoration measure in a degraded area in a Mediterranean environment near Lorca (Spain)*. En: Usó J.L., Brebbia C.A.. Power H. (Eds) Ecosystems and Sustainable development. Advances in ecological Science, Vol 1. Southampton, Boston: Computational mechanics publications pp 165-170.
- Deluchat, V., Bollinger J.C., Serpaud B. and C. Caullet (1997). *Divalent cations speciation with three phosphonate ligands in the pH-range of natural waters*. Talanta, 44:897-907.
- Doran, J.W. and A. Jones (1996). *Methods for assessing soil quality*. SSSA Special Publ. 49. Soil Science Society of America Inc. Madison W.I.
- Eltantawy, I.M. and P.W. Arnold (1973). *Reappraisal of ethylene glycol mono-ethyl ether (EGME) method for surface area estimations of clays*. J. Soil Sci., 24(2):233-237.
- Erviö, R. and J. Palko (1984). *Macronutrient and micronutrient status of cultivated acid sulphate soils at Tupos*, Finland. Ann. Agric. Fenn., 23:121-134.
- Estadísticas climatológicas (1992). Fuerza Aérea Argentina, Comando de Regiones Aéreas, Servicio Metereológico Nacional. Estadística Nº 37, Bs. As. 1º edición.
- Fancelli A. y M. Vázquez (2006). *Micronutrientes en la fisiología de las plantas*. En Micronutrientes en la agricultura. 1º Ed. Asoc. Argentina de la Ciencia del Suelo. 300pp.
- Fassbender H.W. y E. Bornemisza (1994). *Química de suelos con énfasis en suelos de América Latina*. Servicio editorial del Instituto Interamericano de Cooperación para la Agricultura (IICA), 2º ed. rev., San José, Costa Rica, Nº 81.
- Fassbender, H.W. y E. Bornemisza (1987). *Química de suelos, con énfasis en suelos de América Latina*. Servicio editorial del Instituto Interamericano de Cooperación para la Agricultura (IICA), 2º ed. rev., San José, Costa Rica, 420 pp.
- Ferreiro, E., Bussetti S.G. and A.K. Helmy (2002). *Determination of surface area of soil by adsorption methods*. European J. Soil Sci., 53:475-480.
- Franz, J.E., Mao, M.K. and J.A. Sikorski (1999). *Glyphosate: a unique global herbicide*. ACS Monogr. 189-653.
- Frisch, M.J. (2004). *Gaussian 03, Revision C.02*, Gaussian Inc., Wallingford, CT.
- Fuentes, A., Llorens, M., Sáez, J., Soler, A., Aguilar, M.I., Ortúñoz, J.F. and V. Meseguer (2004). *Simple and sequential extractions of heavy metals from different sewage sludges*. Chemosphere, 54:1039-1047.
- Gal, J.Y., Bollinger, J.C., Tolosa, H. and N. Gache (1996). *Calcium carbonate solubility: a reappraisal of scale formation and inhibition*. Talanta, 43:1497-1509.
- Gardner, W.H. (1986). *Water content*. En: Methods of Soil Analysis. Part I. Physical and Mineralogical Methods. Klute A. (Ed.) SSSA Book Series Nº 5, Madison, pp. 493-544.
- Gavande, S.A. (1972). Física de suelos: principios y aplicaciones. Centro regional de ayuda técnica. Editorial Limusa-Wiley, SA., México/Bs. As., 351 pp.
- Gledhill, W.E. and T.C. Feijtel (1992). *Environmental properties and safety assessment of organic phosphonates used for detergent and water treatment applications*. En: Hutzinger, O.E. (Ed.) The Handbook of Environmental Chemistry. Part F, vol. 3. Springer-Verlag, Berlin, Heidelberg, Germany, 261-285.
- Goodman, B.A. and M.V. Cheshire (1980). *The bonding of vanadium in complexes with humic acid, an electron paramagnetic resonance study*. Geochim. Cosmochim. Acta, 39:1711-1716.

- Grassi, R.L., Vuano, B.M. y R.R. Tyberg (1990). *Constantes de estabilidad de los complejos de Cu(II), Mn(II) y Zn(II) con ácido nitrilotris(metilenfosfónico)*. Anales de Química de la Real Sociedad Española de Química, 86B:934-936.
- Grassi, R.L., Acebal, S.G., Vuano, B.M. and O.E. Soulages (1996). *Phosphonic Acids and Biphosphonates as Extractants of Microelements from Sandy Soil*. Arid Soil Res. Rehabil., 10:287-294.
- Grassi, R.L., Santamaría, R.M., Acebal, S.G., Soulages, O.E. and M.delP. Moralejo (1998). *Minor elements extraction in soils with phosphonic acids*. Proceeding of the 16 World Congress of Soil Science, Montpellier, Francia. Symposium Nº 13 B, Scientific Registration Nº 1587. En CD 1-7.
- Green, A.J. (1981). *Manual on soil sampling and methods of Analysis*. Canadian Society of Soil Science, Otawa. En J.A. Mc Keague (Ed).
- Grimshaw, H.M. (1989). *Chemical Analysis of Ecological Materials*. Allen, S.E. ed., Blackwell Scientific Publications, Oxford, 7-45.
- Gundersen, V., Bechmann, I.E., Behrens, A. and S. Stürup (2000). *Comparative Investigation of Concentrations of Major and Trace Elements in Organic and Conventional Danish Agricultural Crops. 1. Onions (*Allium cepa* Hysam) and Peas (*Pisum Sativum* Ping Pong)*. J. Agric. Food Chem., 48:6094-6102.
- Gupta, S.K. and K.Y. Chen. (1975). *Partitioning of Trace Metals in Selective Chemical Fractions of Nearshore Sediments*. Environ. Letters, 10:129-158.
- Hein, L.H., Zenobi, M.C. and E.H. Rueda (2007). *Adsorption of Me-HEDP complexes onto  $\gamma\text{-Al}_2\text{O}_3$* . J. of Colloid and Interface Sci., 314(1):317-323.
- Helmy, A.K., Ferreiro, E. and S.G. Bussetti (1999a). *Surface Area Evaluation of montmorillonite*. J. Colloid Interface Sci., 210:167-171.
- Hendrickson, H.S. (1967). *Comparison of the metal binding properties of nitrilotri-(methylenephosphonic) acid and nitrilotriacetic acid: calcium(II), Ni(II), iron(III) and thorium(IV) complexes*. Analytical Chemistry, 39:998-1000.
- Hlavay, J., Polyák, I., Bódog, I., Molnár, Á. and E. Mészáros (1996). *Distribution of Trace Elements in Filter-collected Aerosol Samples*, Fresenius J. Anal. Chem., 354:227-232.
- Hlavay, J., Prohaska, T., Weisz, M., Wenzel, W.W. and G.J. Stingeder (2004). *Determination of Trace Elements Bound to Soils and Sediment Fractions*. Pure Appl. Chem., 76:415-442.
- Holm, R.H., Kennepohl, P. and E.I. Solomon (1996). *Structural and functional aspects of metal sites in biology*. Chem Rev., 96:2239-2314.
- Horckmans, L., Swennen, R. and J. Deckers (2007). *Retention and Release of Zinc and Cd in spodic Horizons as Determined by pH Analysis and Single Extractions*. The Science of the Total Environment, 376:86-99.
- Hossner, L.R. (1996) *Dissolution for Total Elemental Analysis*. In Methods of Soil Analysis. Part 3. Chemical Methods. SSSA Book Series.
- Ianni, C., Ruggieri, N., Rivaro, P. and R. Frache (2001). *Evaluation and Comparison of Two Selective Extraction Procedures for Heavy Metal Speciation in Sediments*. Analytical Sciences, 17:1273-1278.
- Jackson, M.L. (1964). *Análisis Químico de suelos*. Ediciones Omega. Barcelona. 662 pp.
- Jaworska, J., Van Genderen-Takken, H., Hanstveit, A., Van de Plassche, E. and T.C. Feijtel (2002). *Environmental risk assessment of phosphonates used in domestic laundry and cleaning agents in the Netherlands*. Chemosphere, 47:655-665.

- Jones Jr., J.B., Wolf, B. and H.A. Mills (1991). *Plant Analysis Handbook*. MicroMacro Pub. Inc. Athens, Georgia. USA.
- Kaasalainen, M. and M. Yli-Halla (2003). *Use of Sequential Extraction to Assess Metal Partitioning in Soils*. Environmental Pollution, 126:225-233.
- Kabachnik, M.I., Medved, T.Y., Dyatlova, N.M., Arkhipova, O.G. and M.V. Rudomino (1968). *Organophosphorus Complexones*. Russian Chemical Reviews, 37(7).
- Kabata-Pendías, A. and H. Pendías (1985). *Trace Elements in Soils and Plants*. 2<sup>nd</sup> Ed. CRC Press Inc. Boca Raton. Florida. USA. 365 pp.
- Kabata-Pendías, A. and H. Pendías (2001). *Trace Elements in Soils and Plants*. 3<sup>rd</sup> Ed. CRC Press LCL. Boca Raton. Florida. USA. 413 pp.
- Kan, A.T., Gongmin, F., and M.B. Tomson (2005). *Adsorption and precipitation of an aminoalkylphosphonate onto calcite*. J. Colloid and Interface Sci., 28:275-284.
- Karathanasis, A.D. (2008). *Thermal Analysis of Soil Minerals*. In Methods of Soil Analysis. Part 5. Mineralogical Methods. SSSA Book Series. A.L. Ulery and L.R. Drees Eds.
- Kennedy, V. H., Sanchez, A.L., Oughton, D. H. and A.P. Rowland (1997). *Use of Single and Sequential Chemical Extractants to Assess Radionucleide and Heavy Metal Availability from Soils for Root Uptake*. Analyst, 122:89R-100R.
- Kikbright, G.F. and M. Sargent (1974). *Atomic Absorption and Fluorescence spectrometry*. Ed. Academic Press, London.
- Kilyén, M., Lakatos, A., Latajka, R., Labádi, I., Salifoglou, A., Raptooulou, C.P., Kozlowski, H. and T. Kiss (2002). *Al(III)-binding properties of iminodiacetic acid, nitrilotriacetic acid and their mixed carboxylic phosphonic derivatives*. J. Chem. Soc. Dalton Trans., 46:3578-3586.
- Kiss, T. and I. Lazar (2000). *Structure and stability of metal complexes in solution*. In Aminophosphonic and aminophosphinic acids. Chemistry and biological activity. V.P. Kuhar, H.R. Hudson, Eds. Wiley & Sons New York.
- Klockenkämper, R., Alt, F., Brandt, R., Jakubowski, N., Messershmidt, J. and A. von Bolen (2001). *Results of Proficiency Testing With Regard to Sediment Analysis by FAAS, ICP-MS and TXRF*. J. Anal. Atom. Spectrom., 16:658-663.
- Klute, A. (1986). Methods of soil analysis. Agronomy N° 9, Part 1, 2<sup>nd</sup> Edición. Madison WI. USA, pp. 1188.
- Kubová, J., Matús, P., Bujdós, M., Hagarová, I. and J. Medved (2008). *Utilization of optimized BCR three-step sequential and dilute HCl single extraction procedures for soil-plant metal transfer predictions in contaminated lands*. Talanta, 75:1110-1122.
- Lacour, S., Deluchat, V., Bollinger, J.C. and B. Serpaud (1998). *Complexation of trivalent cations [Al(III), Cr(III), Fe(III)] with two phosphonic acids in the pH range of fresh waters*. Talanta, 46:999-1009.
- Landner, L. and E. Walterson (1993). *Phosphonates used for detergent applications*. Swedish Environmental Research Group (MFG), Stockholm.
- Langmuir, D. (1997). *Aqueous Environmental Geochemistry*. Prentice Hall Inc. pp 82-118.
- Lebourg, A., Stekerman, H., Ciesielski, H., Proix, N. and A. Gomez (1997). *Estimation of soil trace metal bioavailability using unbuffered salt solutions: degree of saturation of polluted soil extracts*. Environ. Tech., 19:243-252.
- Lestan, D., Luo Ch. and X. Li (2008). *The use of chelating agents in the remediation of metal-contaminated soils: a review*. Environmental Pollution, 153:3-13.

- Lesueur, C., Pfeffer M. and M. Fuerhacker (2005). *Photodegradation of phosphonates in water*. Chemosphere, 59:685-691.
- Lindsay, W.L. and W.A. Norwell (1969). *A new DTPA-TEA soil test for Zn and Fe*. Agron. Abstr., 61:84-89.
- Lindsay, W.L. (1972b). *Zinc in soil and plant nutrition*. Adv. Agron., 24:147-151.
- Lindsay, W.L. (1979). *Chemical Equilibria in soils*. John Wiley & Sons Inc. New York. 450pp.
- Lindsay, W.L. and W.A. Norvell (1978). *Development of a DTPA soil test for Zinc, Iron, Manganese and Copper*. Soil Sci. Soc. Amer. J., 42:421-428.
- Logan, E.M., Pulford, I.D., Cook, G.T. and A.B. MacKenzie (1997). *Complexation of Cu<sup>2+</sup> and Pb<sup>2+</sup> by peat and humic acid*. Eur. J. Soil Sci., 48:685-696.
- López-Sánchez, J.F., Rubio, R. and G. Rauret (1993). *Comparison of two sequential extraction procedures for trace metal partitioning in Sediments*. Int. J. Environ. Anal. Chem., 51:113-121.
- *Mapa de Suelos de la Provincia de Buenos Aires* (1989). Escala 1:500.000. Argentina. Secretaría de Agricultura, Ganadería y Pesca. INTA-CIRN. pp. 544.
- Martell, A. and R. Smith. (1982,1979,1977,1976,1975,1974). *Critical Stability Constants*; Vols. 1,2,3,4,5. Plenum Press, New York.
- Matczak-Jon, E. and V. Videnova-Adrabinska (2005). Supramolecular chemistry and complexation abilities of diphosphonic acids. *Coord. Chem. Reviews*, 249:2458-2483.
- Mc Kenzie, R.M. (1980b). *The manganese oxides in soils*. En *Geology and Geochemistry of Manganese*. Varentzov I.M. and Graselly G. Eds., Akadémiai Kiadó, Budapest, 259 pp.
- McBride, M.B. (1994). *Environmental Chemistry of Soils*. Oxford University Press. New York, 331 pp.
- Means, J.L and C.A. Alexander (1981). *The environmental biogeochemistry of chelating agents and recommendations for the disposal of chelated radioactive wastes*. Nucl. Chem. Waste Manage, 2:183-193.
- Mehlich, A. (1984). *Mehlich 3 soil test extractant: A modification of Mehlich 2 extractant*. Commun. Soil Sci. Plant Anal., 15:1409-1416.
- Mengel, K. and E.A. Kirby (1987). *Principles of Plant Nutrition*. 4<sup>th</sup> ed. Ed. International Potash Institute. Bern. Switzerland.
- Mizuno, I., Villa, A.M., Jiménez, M., Moretti, M., Sanguesa, V., Efron, D., L. Berasategui (1988). *Elementos mayores y menores en algunos perfiles de suelos de la provincia de Buenos Aires*. Rev. Fac. Agron., 9(1-2):9-20. Buenos Aires. Argentina.
- Monsanto (1998). Boletín Técnico. Agentes multifuncionales para el control de iones metálicos en solución acuosa. Inhibidores de la corrosión y sedimentación.
- Moralejo, M.delP., Acebal, S.G. and R.M. Santamaría (2003). *Agentes extractantes para la determinación de micronutrientes en suelos. Correlación con niveles en cebolla (Allium cepa)*. Agrochimica, XLVII(3-4):122-131.
- Morera, M.T., Echeverría, J.C., Mazkiarán, C. and J.J. Garrido (2001) *Isotherms and sequential extraction procedures for evaluating sorption and distribution of heavy metals in soils*. Environ. Pol., 113:135-144.
- Morillo, J., Usero J. and J. Garcia (2002). *Partitioning of metals in sediments from the Odiel River (Spain)*. Environ. Int., 28(4):263-271.

- Mortvedt, J.J., Giordano, P.M. and W.L. Lindsay (1983). *Micronutrientes en agricultura*. A.G.T. Editor S.A. México. 742 pp.
- Narro Fariás, E. (1994). Física de suelos con enfoque agrícola. Editorial Trillas, S.A. de C.V., 1º ed, México, 195 pp.
- Nash, K.L. and E.P. Horvitz (1990). *Stability constants for europium(III) complexes with substituted methane diphosphonic acids in acid solutions*. Inorg. Chim. Acta, 169:245-252.
- Nash, K.L. (1997). *f-Element complexation by diphosphonate ligands*. J. Alloys Compd., 249:33-40.
- Nowack, B. and L. Sigg (1995). Comentario sobre el artículo: "Nickel adsorption to hydrous ferric oxide in the presence of EDTA: Effects of component addition sequence" by A.L. Bryce, W.A. Kornicker, A.W. Elzerman and S.B. Clark, Environ. Sci. Technol., 28:2353-2359 (1994), Environ. Sci. Technol., 29:3070-3071.
- Nowack, B. and A.T. Stone (1998). *Behaviour of phosphonates in wastewater treatment plants of Switzerland*. Water Res., 32:1271-1279.
- Nowack, B. and A.T. Stone (2000). *Degradation of Nitrilotris(methylenephosphonic acid) and related (amino)phosphonate chelating in the presence of manganese and molecular oxygen*. Environ. Sci. Technol., 34:4759-4765.
- Nowack, B. (2002a). *Environmental chemistry of aminopolycarboxylates chelating agents*. Environ. Sci. Technol., 36:4009-4016.
- Nowack, B. (2002). *Environmental chemistry of phosphonic acids*. In Phosphorus in environmental technology: principles and applications. Valsami-Jones, E. (Eds.), pp. 147-173.
- Nowack, B. (2003). *Environmental chemistry of phosphonates*. Water Res., 37:2533-2548.
- Nowack, B. (2004). *Environmental chemistry of phosphonic acids*. In Phosphorus in environmental technology: principles and applications. Valsami-Jones, E. (Eds.) pp. 146-169.
- Nowack, B. (2005). *Sequential extraction of metal forms en the soil near a Roadway in Southern Poland*. Analyst, 120:737-739.
- Nowack, B., Schulin, R. and B.H. Robinson (2006). *A critical assessment of chelant-enhanced metal phytoextraction*. Environ. Sci. Technol., 40:5225-5232.
- Nowack, B. and J. Van Briesen (2005). *Biogeochemistry of chelating agents*. ACS Symposium Series. Vol 910.
- Nowack, B., Schulin, R. and B.H. Robinson (2006). *A critical assessment of chelant-enhanced metal phytoextraction*. Environ. Sci. Technol., 40:5225-5232.
- Nowack B. (2008). Guest Editorial: *Chelating agents and the environment*. Environmental Pollution, 153:1-2.
- Owens G., Ferguson V.K., McLaughlin M., Singleton I., Reid R. and F.A. Smith (2000). *Determination of NTA and EDTA and Speciation of their metal complexes in Aqueous solution by capillary electrophoresis*. Environ. Sci. Tech., 34:885-891.
- Pardo, R; Vega M., Debán L., Cazurro C. and C. Carretero (2008). *Modelling of chemical fractionation patterns of metals in soils by two-way and three-way principal component analysis*. Anal.Chim. Acta, 606:26-36.
- Pearson, R.G. (1973). *Hard and Soft Acids and Bases*. Stroudsburg, PA. Dowden, Hutchinson and Ross.

- Pérez, G. and M. Valiente (2005). Determination of Pollution in an Abandoned Mining Site by Application of a Multivariate Statistical Analysis to Heavy Metals Fractionation using SM&T-SES. The Royal Society of Chemistry. *J. Environ. Monit.*, 7:29-36.
- Podlesáková, E., Nemecek, J. and R. Vácha (2000). *Mobility and Bioavailability of Trace Elements in Soils*. In: *Trace Elements in Soil Bioavailability, Flux and Transfer* (Eds. I.K. Iskandar & M. B. Kirkham) Lewis Publishers, Florida. 21-41 pp.
- Popov, K., Ronkkomaki, H. and L. Lajunen (2001). *Critical evaluation of stability constants of phosphonic acids (IUPAC Technical Report)*. *Pure Appl. Chem.*, 73(10):1641-1677.
- Popova, I.A. and K.I. Popov (2003). <sup>31</sup>P NMR Study of Complexation between Thallium(III) and Diethylenetriaminopentakis(methylenephosphonic acid). *Russ. J. Coord. Chem.*, 29:307-309.
- Porta, J., López Acevedo, M. y C. Roquero (1999). *Edafología para la agricultura y el medio ambiente*. Ediciones Mundi-Prensa, Barcelona, 2º ed, 849 pp.
- Porta, J., López Acevedo, M. y C. Roquero (2003). *Edafología, para la agricultura y el medio ambiente*. Ediciones Mundi-Prensa. 3º edición revisada y ampliada. Madrid, Barcelona, México, 929 pp.
- Price, W.J. (1979). *Spectrochemical Analysis by Atomic Absorption*. Ed. Heyden & Son. London.
- Quevauviller, Ph. (1998a). *Operationally-defined extraction procedures for soil and sediment analysis. I. Standardization*. *Trends Anal. Chem.*, 17:289-298.
- Quevauviller, Ph. (1998b). *Operationally defined extraction procedures for soil and sediment analysis. II. Certified reference materials*. *Trends Anal. Chem.*, 17(10):632-642.
- Quevauviller, Ph. (2002). *III New CRMs for trace element extractable contents*. *Trends Anal. Chem.*, 21:774-785.
- Quevauviller, Ph., Rauret, G., Muntau H., Ure, A.M., Rubio R. and J.F. López-Sánchez (1994). *Evaluation of a sequential extraction procedure for the determination of extractable trace-metal contents in sediments*. *Fresenius Anal. Chem.*, 349:808-814.
- Rao, C.R.M., Sahuquillo, A. and J.F. Lopez-Sanchez (2010). *Comparison of Single and Sequential Extraction Procedures for the Study of Rare Earth Elements. Remobilisation in Different Types of Soils*. *Analytica Chimica Acta*, 662:128-136.
- Rauret, G., López-Sánchez, J.F., Sahuquillo, A., Muntau, H. and Ph. Quevauviller (2000). *Indicative values for extractable contents (mass fractions) of Cd, Cr, Cu, Ni, Pb y Zn in sediment (CRM 601) following the modified BCR-sequential extraction (three-step) procedure*. BCR Information. Reference Materials Report. EUR 17554 EN.
- Rauret, G., López-Sánchez, J.F., Sahuquillo, A., Rubio, R., Davidson, C.M., Ure, A.M. and Ph. Quevauviller (1999). *Improvement of the BCR three-step sequential extraction procedure prior to the Certification of new Sediment and Soil Reference Materials*. *J. Environ. Monit.*, 1:57-61.
- Rayner-Canhaw, G. (2000). *Química Inorgánica Descriptiva*. 2º edic. Pearson Educación, México.
- Reemtsma, T., Weiss, S., Mueller, J., Petrovic, M., González, S., Barcelo, D., Ventura, F. and T.P. Knepper (2006). *Polar pollutants entry into the water cycle by municipal wastewater: a European perspective*. *Environ. Sci. Technol.*, 40:5451-5458.
- Rizkalla, E.N. and G.R. Choppin (1983). *Nuclear Magnetic Resonance Study of Ethylenediaminetetrakis(methylenephosphonic acid) and some Metal Complexes*. *Inorg. Chem.*, 22:1478-1482.

- Rizkalla, E.N. (1983). *Metal chelates of phosphonate containing ligands*. Rev. Inorg. Chem., 5:223-304.
- Rizkalla, E.N., Zaki, M.T.M. and M.I. Ismail (1980). *Metal Chelates of Phosphonate-Containing Ligands*. V. Talanta, 27:715-719.
- Robinson, G.W. (1922). *A new method for the mechanical analysis of soils and other dispersions*. J. Agric. Sci., 12:306-321.
- Ron, M. y T. Loewy (2006). *Micronutrientes del SO bonaerense y cereales de invierno*. En Micronutrientes en la agricultura. 1º Ed. Asoc. Argentina de la Ciencia del Suelo. 300pp.
- Sahuquillo, A., López Sánchez, J.F., Rubio, R. and G. Rauret (1995). *Extractable Chromium Determination in Soils by AAS*. Microchim. Acta, 119:251-258.
- Sahuquillo, A., Rauret, G., López Sánchez, J.F., Rubio, R., Thomas, R.P., Davidson, C.M. and A.M. Ure (1999). *Use of a certified reference material for extractable trace metals to assess sources of uncertainty in the BCR three-stage sequential extraction procedure*. Anal. Chim. Acta, 382:317-327.
- Sahuquillo, A., Rigol, A. and G. Rauret (2003). *Overview of the use of leaching/extraction tests for risk assessment of trace metals in contaminated soils and sediments*. Trends Anal. Chem., 22(3):152-159.
- Sánchez, R., Pezzola, N. y J.V. Cepeda (1998). *Caracterización edafoclimática del área de influencia del INTA E.E.A. Hilario Ascasubi*. Boletín de divulgación Nº 18.
- Sawada, K., Araki, T. and T. Suzuki (1987). *Complex Formation of Amino Polyphosphonates. 1. Potentiometric and nuclear magnetic resonance studies of Nitrilotris(methylenephosphonate) complexes of alkaline earth metal ions*. Inorg. Chem., 26:1199-1204.
- Sawada, K., Araki, T., Suzuki, T. and K. Doi (1989). *Complex Formation of Amino Polyphosphonates. 2. Stability and Structure of Nitrilotris(methylenephosphonate) Complexes of the Divalent Transition-Metal Ions in Aqueous Solution*. Inorg. Chem., 28:2687-2688.
- Schwarzenbach, G., Ackermann, H. and P. Ruckstuhl (1949). *New derivate der iminodiessigsäure und ihre Erdalkalikomplexe*. Helv. Chim. Acta, 32:1175-1186.
- Schwertmann, U. (1973). *Use of oxalate for Fe extraction from soils*. Can. J. Soil Sci., 53:244-248.
- Serie U.S. Geological Survey-Bulletin 1563 (1980).
- Shuman, L. M. (1991). *Chemical forms of Micronutrients in Soils*. In *Micronutrients in Agriculture*. (Book Series 4), pp.113-144. Mortvedt, J.J., Cox, F.R., Shuman, L.M., M.R. Welch (Eds.) SSSA, Madison, Wisconsin, USA.
- Sillampää, M. (1982). *Micronutrients and the nutrient status of soils: A global study*. Ed. FAO. Soil Bulletin 48. Roma. Italia. 444 pp.
- Sillampää, M. (1997). *Environmental fate of EDTA and DTPA*. Rev. Environ. Contam. Toxicol., 152:85-111.
- Sillén, L.G. and A.E. Martell (1971). *Stability constants of metal-ion complexes. Special Publications 25, Supplement 1*. The Chemical Society, Burlington House, London.
- Skoog, D. and D. West (1983). *Fundamentos de Química Analítica*. 2º ed. Ed. Reverté. 957 pp.
- Soil Survey Staff-USDA (1999). *Soil Taxonomy: A Basic System for Classifying Soils*. Agriculture Handbook 436, 863 pp.
- Solutia (2005). Boletín Técnico.

- Soulages, O.E., Acebal, S.G., Grassi, R.L. y B.M. Vuano (1997). *Ácido nitrilotri-(metilénfosfónico) como agente de extracción de elementos menores en suelos*. An. Asoc. Quím. Arg., 85:261-268.
- Sparks, D. (2003). *Environmental Soil Chemistry*. 2<sup>nd</sup> Ed. Academic Press. Elsevier Science. 352 pp.
- Sposito, G. (1989). *The Chemistry of Soils*. Oxford Univ. Press. London, United Kingdom, 227 pp.
- Sposito, G., Lund, L.J. and A.C. Chang (1982). *Trace Metal Chemistry in Arid-zone Field Amended with Sewage Sludges: I Fractionation of Ni, Cu, Zn, Cd and Pb in solid Phases*. Soil Sci. Soc. Am. J., 46(2):260-264.
- Steber, J. and P. Wierich (1987). *Properties of aminotris(methylenephosphonate) affecting its environmental fate: degradability, sludge adsorption, mobility in soils and bioconcentration*. Chemosphere, 16:1323-1337.
- Stolzy, L.H. and W.A. Jury (1982). *Soil Physics*. In V.S. Kilmer: Handbook of Soils and Climate in Agriculture, CRC Series in Agriculture. CRC Florida. pp. 131-158.
- Stone, A.T., Knight, M.A. and B. Nowack (2002). *Speciation and Chemical Reactions of Phosphonate Chelating Agents in Aqueous Media*. pp. 59-94. Chemicals in the Environment. Lipnick R. Edit. American Chemical Society.
- Tantayakom, V., Sreethawong, T., Scott Fogler, H., de Moraes, F.F. and S. Chavadej (2005). *Scale inhibition study by turbidity measurement*. J. of Colloid and Interf., 284:57-65.
- Templeton, D.M., Ariese, F., Cornelis, R., Danielsson, L.G., Muntau, H., Van Leeuwen, H.P. and R. Lobinski (2000). *Guidelines for Terms related to chemical speciation and fractionation of Elements-Definitions. Structural Aspects and Methodological Approaches*. Pure Appl. Chem., 72(8):1453-1470.
- Ternan, J.L., Fitzjohn, C. and A.G. Williams (1998). *Soil moisture variability in a semi-arid gully catchment: implications for runoff and erosion control*. Catena, 32(1): 55-70.
- Tessier, A., Campbell, P.S.C. and M. Bisson (1979). *Sequential Extraction Procedure for the Speciation in River Sediments*. Anal. Chem., 51:844-851.
- Tomson, M.B., Kan, A.T. and J.E. Oddo (1994). *Acid/base and metal complex solution chemistry of the polyphosphonate DTPMP versus Temperature and Ionic Strength*. Langmuir, 10:1442-1449.
- Torres Sánchez, R.M. and S. Falasca (1997). *Specific surface area and surface charges of some argentinian soils*. Z. Pflanz. Bodenk., 160:223-226.
- Trierweiler, J.F. and W.L. Lindsay (1969). *EDTA-(NH<sub>4</sub>)<sub>2</sub>CO<sub>3</sub>. Soil test for zinc*. Soil Sci. Soc. Am. Proc., 33:49-54.
- Ure, A. M. (1996). *Single Extraction Schemes for Soil Analysis and Related Applications*. Sci. Total Environ., 178:3-10.
- Ure, A.M., Quevauviller, Ph., Muntau, H. and B. Griepink (1993). *Speciation of heavy metals in soils and sediments*. Int. J. Environ. Anal. Chem., 51:135-141.
- Van Raij, B. (1991). *Geoquímica de micronutrientes de “Micronutrientes na Agricultura”*. Edit. Ferreira y Pessoa Da Cruz. Brasil. 100 pp.
- Walkley, A. (1946). *A critical examination of rapid method for determining organic carbon in soils. Effect of variations in digestion conditions and of inorganic soil constituents*. Soil Sci., 63:251-263.
- Wang, K.H., McSorley, R. and R.N. Gallaher (2004). *Relationship of soil management history and nutrient status to nematode community structure*. Nematropica, 34:83-95.

- Wells, A.F. (1984). Structural Inorganic Chemistry. Oxford University Press. Oxford. 1382 pp.
- Westerback, S., Rajan, K.S. and A.E. Martell (1965). *New multidentate ligands. III Amino acid containing methylene phosphonate groups*. Journal of American Chemical Society, 87:2567-2572.
- Whalley, C. and A. Grant (1994). Assessment of the phase selectivity of the European Community Bureau of Reference (BCR) sequential extraction procedure for metals in sediments. *Anal. Chim. Acta*, 29:287-293.
- White, J.G. and R.J. Zasoski (1999). *Mapping Soil Micronutrients*. Field Crops Research, 60,11-26.
- Wiersma, D., Van Goor, B. J. and N.G. Van der Veen (1986). *Cadmium, Lead, Mercury and Arsenic Concentrations in Crops and Corresponding Soils in The Netherlands*. *J. Agric. Food Chem.*, 34:1067-1074.
- Wild, A. and L.H.P. Jones (1992). *Nutrición mineral de las plantas cultivadas*. De "Condiciones del suelo y desarrollo de las plantas según Russell". Edic. Mundi-Prensa. Madrid. 1045 pp.
- Wolf, B. (1982). *An improved universal extracting solution and its use for diagnosing soil fertility*. *Commun. Soil Sci. Plant Anal.*, 13(12):1005-1033.
- Wolf, K. and P.A. Gilbert (1992). *EDTA-Ethylenediaminetetraacetic acid*. In The Handbook of Environmental Chemistry (Ed. Hutzinger, O.) 3, Part F, 243-259.
- Wolt, J. (1994). *Soil Solution Chemistry*. John Wiley & Sons, Inc. New York. 345pp.
- Zalba, P. (1989). *Efectos del riego con agua salinizada sobre el suelo y los cultivos del valle Inferior del Río Colorado* (Buenos Aires) Tesis Magister en Ciencias del Suelo. Universidad Nacional del Sur.
- Zenobi, M.C., Hein, L.E. and E.H. Rueda (2005). *The effect of 1-hydroxyethane-(1,1-diphosphonic acid) on the adsorptive partitioning of metal ion onto  $\gamma$ -AlOOH*. *J. of Colloid and Interface Sci.*, 284(2):447-454.
- Zenobi, M.C. (2008). *Estudio de las reacciones superficiales de ligandos fosfónicos en el sistema óxido de aluminio-solución y su influencia en la movilidad de metales pesados*. Tesis Doctoral. Universidad Nacional del Sur. Bahía Blanca. Argentina.