C_{60}	9442,7;	
$C_{59}N^{+}{*}CN^{-}$ — CN^{-}	9316,5	(Δ 126,2);
$C_{58}N_2^{2+}{*}CO_2^{2-}$ — CO_2^{2-}	9256,8	(Δ 59,7);
$C_{57}N_3^{3+}{*}PO_3^{3-}$ — PO_3^{3-}	9231,4	(Δ 25,4).

Подібна величина (D) для 8в-азанафтиліденій ціаніду становить 134,4 ккал/моль. Як бачимо, у цьому випадку тенденція змінюється на зворотну. Причина, вірогідно, полягає у кращих умовах для врівноваження позитивного заряду на азафулереновій сфері аніоном, уміщеним до її порожнини.

Аніони в азоніафуренових солях є "ув'язненими" як у комірці кристалів, але на відміну від останніх можливість для дисоціації в даному випадку виключена. Синтез таких сполук відкриє можливості вивчення їх непередбачених фізико-хімічних властивостей. З іншого боку, змінюючи розмір фулерену, можна регулювати вільний простір, в якому аніон буде рухатись, наприклад, під дією магнітного поля.

Jan C. Hummelen, B. Knight, J. Pavlovich, R. Gonzalez, F. Woodl, SIENCE, Vol. 269, 1554—1556 (1995).

DETECTION AND IDENTIFICATION OF NITROGEN-CONTAINING METABOLITES IN BRAIN BY ^{14}N NMR SPECTROSCOPY

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In this report we discuss the following problems of metabolites monitoring by nitrogen-14 nuclear magnetic resonance spectroscopy: 1) inadequate signal-to-noise because of low concentration and because data acquisition times are limited; 2) inadequate resolution, masking important spectral features; 3) inadequate assignments limiting the extent to which ^{14}N spectra can be interpreted and 4) baseline problems caused by acoustic ringing and by presence of macromolecules.

In vitro ^{14}N NMR spectra of brain (experimental animals) were recorded without ^{1}H decoupling at 14,46 MHz on a Bruker CXP-200 spectrometer using a high power probehead (10mm tube) equipped with a horizontal solenoid coil. Multipulse sequences based on linear properties of the distortions were used for reduce the acoustic ringing artefacts in ^{14}N spectra.

Brain tissues contain a large number of nitrogen-containing compounds but the ^{14}N liquid phase NMR techniques is only sensitive to

compounds which has a relatively symmetric electronic environment. The next metabolites were detected and identified in ^{14}N NMR spectra of brain: trimethylamine compounds such as choline, acetylcholine, phosphatidylcholine, sphingomyelin, several amino acids (predominantly glutamine, glutamate, asparagin, aspartate and glycine) and ammonia NH_4^+. These trimethylamine compounds as well as several amino acids are difficult to resolve in spectra. This fact is due to: a) broad lines due to tissues heterogeneity, b) overlap of lines with different T_2^*. Based on their ^{14}N NMR parameters ammonia may prove to the most practical compounds for study nitrogen metabolism in brain. Note that brain ammonia is an important byproduct of the metabolism of the putative neurotransmitters glutamate and aspartate and of the neurotransmitter monoamines. It is also the product of the synthesis of glutamate from glutamine in nerve endings.

Thus a typical ^{14}N NMR brain spectrum only shows resonances from a limited number of relatively concentrated (>10 mMol/l) low molecular weight metabolites. Many nitrogen-containing metabolites are unmeasurable because their concentrations fall below 1—10 mMol/l limit. Moreover ^{14}N NMR measures the mobil fraction of the metabolite that contributes to the high resolution signal in the spectrum. The fraction of the metabolite that is immobilised by precipitation or by tight binding to macromolecules, membranes or organelles is undetectable.

It is necessary to note that an important aspect of the technique is the pH dependence of the NH_4^+ chemical shift making it possible to estimate intracellular pH non-invasively.

In conclusion our results showed that nitrogen-^{14} NMR spectroscopy allows to monitor in vitro many nitrogen-containing metabolites in brain, to measure active (non-bound) metabolites and to carry out study of biochemical changes.

^{14}N AND ^{31}P NMR *IN VIVO* STUDIES OF BACTERIAL CELL SUSPENSIONS

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Application of instrumentation-based techniques for studying of microorganisms has been increased rapidly for the last decades. The overwhelming majority of biochemical and biophysical bacterial cells