

Preparations for K- Beamtime:

Tests and setup for K from off line ion source

Do we need spare parts?

Switch to K- source (Please take pictures!)

Optimization of EBIT injection with ^{39}K
4 T ↔ 5 T

Investigation of TOF resolution after EBIT extraction:

can we resolve K^{+9} from $\text{C}^{3+}/\text{O}^{4+}$ and N^{3+} ?

if not x) use $^{38}\text{K}^{4+}$ instead or

x) dipole cleaning (possibly EBIT and MPET) of $\text{C}^{3+}/\text{O}^{4+}$ and N^{3+}

Investigation of dipole cleaning with HCI (EBIT)

separate $\text{C}^{3+}/\text{O}^{4+}$ and N^{3+}

Optimization of charge breeding with ^{39}K charge state $q = 9 / q = 4$

Optimization of transfer and injection of $^{39}\text{K}^{+q}$ into MPET

Investigation of dipole cleaning with HCI (MPET)

separate $\text{C}^{3+}/\text{O}^{4+}$

is it feasible to clean isomer from ground state?

effect of dipole cleaning on species of interest

Quantify charge exchange probability of $^{39}\text{K}^{+q}$ in MPET as a function of T

Determination of losses when storing ion bunches of $^{39}\text{K}^{+1}$ for 1-5 s in EBIT (trapping potential should be low enough such that recoil kicks ^{38}Ar out of the trap)

Implementation of cycle to be used for ^{38}K - g.s (The $^{38\text{m}}\text{K}$ cycle is identical except for the storage of ions in the EBIT)

Injection of K into EBIT

Store ions in EBIT for 3-5 s

Charge breed K to $q=9 / q = 4$

(Dipole cleaning EBIT)

Transfer HCI to MPET

(Dipole cleaning MPET)

Confirm settings for $^{39}\text{K}^{+1}$: to be used for neutron rich K; form RFQ directly into MPET

MPET Vacuum

- Restrictor after switchyard.
- Possibly remove PIPS if a leak is found there
- Test if moderate 'baking' (=increase outgas rate) of MPET vacuum chamber at ??? degree Celsius works: 'baking' with installed system or heat gun
- Bake MPET vacuum chamber at ??? for ??? days

Timeline for Preparations:

Week Jul 26 – Aug 1, 2009

Switch to K- source (Max, Mel, Aaron)

Week Aug 2 – 8 2009

Restrictor after switchyard (Mel)

Possibly remove PIPS if a leak is found there (Mel)

Optimization of EBIT injection with ^{39}K (Alain, Aaron)

Spare parts? (Max, Alain, Thomas)

Week Aug 9 – 15 2009

Investigation of TOF resolution after EBIT extraction (Alain, Max)

Determination of losses when storing ion bunches of $^{39}\text{K}^{+1}$ for 1-5 s in EBIT (Thomas)

Test of moderate 'baking' of MPET vacuum chamber (Scott, Max)

Week Aug 16 – 22 2009 (Stephan is back at TRIUMF Aug 17, Paul F. arrives Aug 21)

Investigation of dipole cleaning with HCl in EBIT (Alain, Aaron)

Optimization of charge breeding with ^{39}K charge state $q = 9 / q = 4$ (Alain, Max, Stephan)

DO NOT CHANGE MAGNETIC FIELD starting Aug 20 (b-NMR)

Week Aug 23 – 29 2009

Optimization of transfer and injection of $^{39}\text{K}^{+q}$ into MPET (Alain, Max, Stephan)

Investigation of dipole cleaning with HCl in MPET (Paul F., Stephan)

Week Aug 30 – Sep 5, 2009

Quantify charge exchange probability of $^{39}\text{K}^{+q}$ in MPET as a function of T (Paul F., Stephan)

Confirm settings for $^{39}\text{K}^{+1}$

Week Sep 6 – 12 2009

Implementation of cycle to be used for ^{38}K - g.s

Bake MPET vacuum chamber

Beamtime: Sep 11-14 2009

Beamtime

Try to perform resonances of highly charged ^{38}K and $^{38\text{m}}\text{K}$: if this is possible, the following systematic tests will be performed

- x) investigate development of both center frequencies with 5-4-3-2-1 ions per shot
- x) confirm that difference between ground state and isomer corresponds to 130.1(2) keV measured by Leach et al.
- x) measure f_c for ^{38}K without $^{38\text{m}}\text{K}$

Measurement of $^{38}\text{K}^{+q}$ versus $^{39}\text{K}^{+q}$

(since we plan to measure $^{38}\text{Ar}^{+q}$ versus $^{39}\text{K}^{+q}$ with the same configuration at a later point in time, a detailed documentation will be essential; otherwise systematic effects won't cancel in the determination of the Q-value)

Measurement of neutron rich K isotopes (HCI and/or singly charged)