PAGE NO.:
DATE: / /

* Measurement of Radioactivity :-

Basic concept

Atom - smallest unit of element having properties of that element.

↓

consist the charge nucleus + -ve electrons.

Nucleus - P+N.

→ Atomic Number - Number of proton in nucleus.

→ Mass Number - Total of P and N. (MW)

- Isotope → same atomic no. different mass ~~number~~ number.

↓

- Diff. mw
- Diff. nucleus content
- chemical property = same.

[Eg. chemical property is no of electrons]

- Radioactive Decay :- evidence of nuclear unstability

Unstable Isotope —Decay→ stable isotope

by adding ~~and~~ or removing ~~something~~ P, N are

- Types of radioactive decay.

① α decay :- shedding of nuclear mass.

~~Adding~~ removal of 2 P and 2 N. →

identified as helium nucleus.

DATE: / /

α decay: $M_{Pn Nn} \xrightarrow{\alpha \text{ decay}} M_{Pn-2, Nn-2} + {}^{4}_{2}He$ (2p⁺ 2N) stable

(3) Bela Decay

↓

by Rearrange ment of nucleus.

↓

total no. of in nucleus is unchanged.

Nutron → e^- + p^+ (β particle) (conversion of n→p)

Proton → e^+ + N (positron). (" of p→n)

$M_{Pn Nn} \xrightarrow{\beta \text{ decay}} M_{Pn+1, Nn-1} + e^-$

$M_{Pn Nn} \longrightarrow M_{Pn-1} + N_{n-1} + e^+$

ex: ^{32}P → hard β emitter → ↑ kinetic energy

tritium → soft " → low "

(3). γ decay :- wave electromagnetic wave

↓

high energy photon → high penetrating powers.

ex = ^{131}I

(4) Electron capture :-

orbital e⁻ is captured (absorbed. by nucleus.

↓

. Proton in nucleus is changed

. Atomic Number ↓ed by 1. → Mass number same.

$P_n N_n + e^- \xrightarrow[\text{capture}]{\text{electron}} P_{n-1} N_n$

^{195}I EC decay; tellurium 195.

↓
gel electrophoresis
↓
Photographic film is applied to cover gel
↓ ↓ incubation.
resulting image reflects radioactivity of target Nucleic acid.

② gas-filled detectors :

Certain gas filled in detector
↓
Detect / capture ions produced by radiation

use → ① Ionizing chamber
② Geiger counter → portable radiation monitor

③ Scintillation Counting :-
Absorption of radiation produces light.
↓
by ① crystal scintillation detector : or
② organic liq. " "

Sod. iodide
crystal used. → RIA

Automated centrifuge:

① Axial separation module (ASM)

↓

- centrifuge one sample at a time in axial process container.

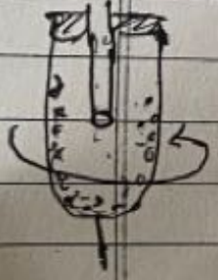
↓

time: 1 in 1 min spee. (cell has to traverse only through radius of tube)

- cost effective than conventional
- allows automation in area of sample processing.

Components

① Specimen input tray
② processing chamber.
③ Holding tray.



Sample is placed in holding tray

↓

ASE module rotate at its own axis

↓

Serum separated in center where as cells settled as periphery

Advance :-

During separation sample probe can pierce rubber top and collect the serum sample directly

↓

No need of separat^{n} step

↓ ↘

Automation ↓TAT.