

CONCEPT: GAMMA EMISSION

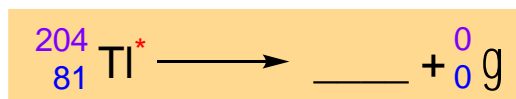
- **Gamma Emission** often occurs alongside _____ or _____ decay and emits *gamma rays*.

□ **Gamma Ray** is a high-energy _____ particle, a type of energy.

- Part of _____ radiation, has _____ mass or charge and is symbolized as:

$$\begin{array}{c} 0 \\ 0 \end{array} \text{ — or — }$$

□ Gamma rays are emitted by an atom in an _____ state.



EXAMPLE: Provide a balanced nuclear reaction for alpha decay of Am-241. Show gamma emission.

Characteristics of Gamma Rays

- Gamma rays are the _____ in size, lowest in ionizing power but _____ in penetrating power.

Types of Radioactivity						
Type	Particle	Example	Size	Ionizing Power	Penetrating Power	Shield
Alpha Decay	${}_2^4\alpha$	${}_{78}^{171}\text{Pt} \longrightarrow {}_{76}^{167}\text{Os} + {}_2^4\alpha$	Largest	Highest	Lowest	Clothing, skin, paper, air
Beta Decay	${}_{-1}^0\beta$	${}_{34}^{81}\text{Se} \longrightarrow {}_{35}^{81}\text{Br} + {}_{-1}^0\beta$	Smaller	Lower	Higher	Sheet of metal or thick wood
Gamma Emission	—	${}_{81}^{204}\text{Tl}^* \longrightarrow {}_{81}^{204}\text{Tl} + {}_0^0\gamma$	—	—	—	—

EXAMPLE: Which statement is true about gamma rays?

- Can only be stopped by aluminum.
- Possesses the highest ionizing power.
- It is capable of penetrating through many kinds of protective materials.
- Emitted by excited electrons.