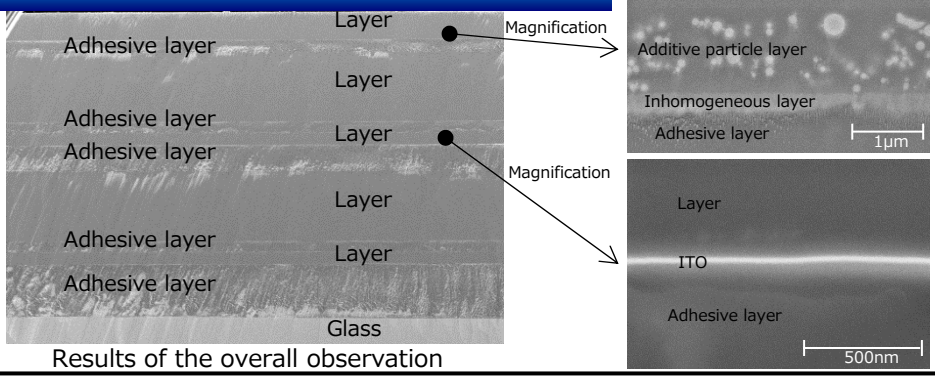
Evaluation of peripheral components of display panels

For display panels, higher specifications are needed not only in the structure of display parts but also in the peripheral parts (sealing, planarization layer, wiring, optical film, touch panel etc.). The analytic menu and SEM observation example are shown below.

Evaluation menu for the peripheral components of panel

Items for evaluation	Analysis items and purposes	Applicable methods
Evaluation of optical film and touch panel		
Film, Adhesives, Sealing agents	Analysis of composition and structure	IR, NMR, MS, PyGC/MS, fluorescent X-ray, TOF-SIMS
	Measurement of trace additives	Preparation of GPCs + (IR, NMR, MS), HPLC-UV,HPLC-ELSD,LC/MS, GC, GC/MS, etc.
	Higher-order structural analysis (orientation and crystallinity)	IR, Raman, X-ray diffractometry
	Optical properties (refractive index, absorbance, reflectance)	Spectral ellipsometer, Spectrophotometer
	Thermal property	DSC, TMA (thermal expansion coefficient measurement)
	Moisture adsorption and permeation measurements	Measurements of water vapor/gas adsorption, Mocon method, TPD-MS
	Depth profile analysis	GD-OES, SIMS
	Morphological observation	SEM/EDX
Touch-panel	Morphological observation and compositional evaluation	SEM/EDX, TEM/AEM
Peripheral parts evaluation of pixel		
TFT	Morphological observation, impurity evaluation, and dopant distribution	TEM, SIMS, TOF-SIMS, SCM, SSRM
Oriented film CF, Planarizing film, Sealing film	Compositional analysis, orientational evaluation, and foreign matter (repellency)	IR, TOF-SIMS, NMR, PyGC/MS, SEM
	Pigment identification	Raman, IR
	Heated gas	GC/MS, TPD-MS
Seal evaluation		
Mold resin	Morphological observation and compositional analysis	SEM/EDX, IR, PyGC/MS
Sealing glass	Morphological observation and compositional analysis	SEM/EDX
Sealing film	Morphological observation and compositional analysis	SEM, SIMS, RBS, IR, NMR, MS, PyGC/MS, fluorescent X-ray
Filler gas	Identification of gas type and water content	TPD-MS, sealing assessment (isotopic marker method)

SEM Observation (Optical Film,Touch Panel



Results of the overall observation

From the overall observation results in the left figure, five layers (excluding the adhesive layer) can be seen and a layer containing additive particles and a stack with transparent electrode is also found.

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